

AMERICAN ARTISAN

DECEMBER, 1947

IDENTICAL AIR CONDITIONING WARM AIR HEATING SHEET METAL CONTRACTING

In This Issue

ets and figures citing the advantages of sufficient insulation for exposed air conditioning ducts are discussed by R. C. Nason. Turn to Page 79.

ank E. Anderson of Indiana, and Roger Keith of Iowa discuss important topics this month. "Open For Discussion" on Page 84.

ighly informative article about the use of your beam bender, bar folder, and hand brake is this month's installment of the series "Tools and Their Uses." Authored by Ernest E. Zideck and amply illustrated on Page 103.

uefied Petroleum Gas sales are now being reported in billions of gallons. On Page 109 the text of Howard D. White's talk during the "Fuel Forum" at the IWAH&CA Convention is presented.

The Cover Picture

ters at a CHICAGO IRVING Prize Winning display interest in a fired winter air conditioning unit.





"THEY REALLY FIT!"

C&L-Lamneck fittings are made to standard sizes and manufactured with precision machinery. All fittings are gauged to size and checked for accurate fit by experienced inspectors.

The complete gravity line is now being supplied. The 700 system for forced air is complete, except for plenum chamber, trunk and large trunk fittings.

Specify **C & L-LAMNECK FROM YOUR JOBBER**
 Our latest catalog and name of your nearest C & L jobber will be sent on request.

CLAYTON & LAMBERT MFG., CO.

LOUISVILLE 10 1760 Dixie Highway KENTUCKY

OTHER C & L PRODUCTS: C & L-Blow Torches, Fire Pots; C & L-Hoffman Water Heaters; C & L-Monarch Builders Finish Hardware; Buckeye Corn Cribbs, Grain Bins; Silver Shield Silos.

Lamneck

**FURNACE PIPE
AND FITTINGS**

30 *days* from now.....

The 1948 Evaporative Kooler-aire
with Gyro-Spray
continues to be the
Magic Worker in Evaporative Cooling
with New Improvements
and Operating Efficiencies

TEAM UP WITH KOOLER-AIRE LEADERSHIP FOR FASTER
SELLING AND BETTER PROFITS IN 1948

UNITED STATES AIR CONDITIONING CORPORATION
Como Ave. S. E. at 33rd, Minneapolis, Minnesota

Evaporative
Kooler-aire

THE MAGIC WORKER IN LOW COST COMFORT COOLING

AMERICAN ARTISAN

Member—Audit Bureau of Circulations
Member—Associated Business Papers

**RESIDENTIAL
AIR CONDITIONING
WARM AIR HEATING
SHEET METAL CONTRACTING**

Merged with American Artisan are "Warm Air Heating" and "Furnaces and Sheet Metals"

MANAGEMENT

EDITORIAL—FWA—1927 . . . CAC—1947 . . .	67
KRUCKMAN—REACTIONS TO TRUMAN'S MESSAGE .	69
NEWS SUMMARY OF THE MONTH	70
PARTNERSHIPS AND INCOME TAX	71
WAGE INCENTIVE PLANS (III)	72
ROCHESTER APPRENTICE STANDARDS	74

RESIDENTIAL AIR CONDITIONING

INSULATION FOR AIR CONDITIONING DUCTS . . .	79
CORRECT PRACTICE IN OIL HEATING	81
OPEN FOR DISCUSSION	84
NEUBECKER—TRIPLE BRANCHES TO SQUARE DUCT	86
DUCTWORK ESTIMATING TABLES (II)	89

SHEET METAL CONTRACTING

UNUSUAL SHEET METAL WORK A SPECIALTY . .	95
DESIGN OF WASTE REMOVAL SYSTEMS (IV) . . .	99
WELDING ALUMINUM OF HEAVY GAUGES	102
TOOLS AND THEIR USES (VI)	103

DEPARTMENTS

THE EDITOR'S NOTEBOOK	6
CONVENTION REPORTS	109
"LP-Gas" by Howard White	
ASSOCIATION ACTIVITIES	112
EQUIPMENT DEVELOPMENTS	116
EDITORIAL INDEX—1946 & 1947	120
NEW LITERATURE	130
WITH THE CONTRACTORS	137
WITH THE MANUFACTURERS	140

EDITOR

JOHN E. PETERSON

ASSOCIATE EDITOR

JOHN McCULLOUGH

ASSISTANT EDITOR

A. A. KENNEDY

ADVERTISING STAFF

WALLACE J. OSBORN
New York City
Murray Hill 9-8293

ROBERT A. JACK
Cleveland
Yellowstone 1540

JAMES D. THOMAS
GEORGE C. CUTLER
Chicago
State 6916

ROBERT P. WETTSTEIN
Los Angeles—Tucker 2779
San Francisco—Yukon 6-2522

Published monthly by Keeney Publishing Company, 6 N. Michigan Ave., Chicago 2, Ill., U.S.A.
Copyright 1947 by Keeney Publishing Company

Publisher—FRANK P. KEENEY

Manager—CHARLES E. PRICE

Production Manager—L. A. DOYLE

Yearly Subscription Price—U.S. and possessions, Canada, Mexico, South America, Central America, \$3.00; Foreign, \$6.00. Single copies, U.S. and possessions, \$.35. Back numbers, \$.60. January, 1947, Directory Issue, \$1.00 per copy. Entered as second-class matter, July 29, 1932, at the post office at Chicago, Illinois, under the Act of March 3, 1879. Additional entry at Milwaukee, Wisconsin.

Founded 1880

DECEMBER, 1947

Volume 116, No. 12

AMERICAN ARTISAN, December, 1947



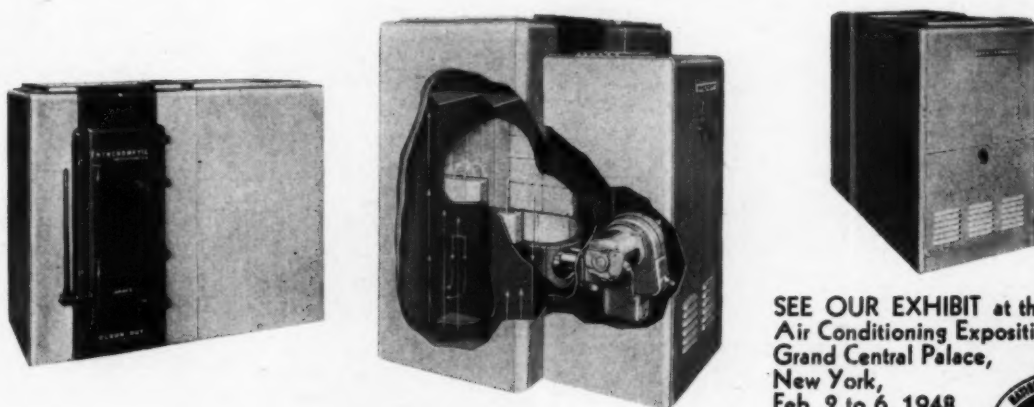
*Your feet ARE on
the Ground...*

WHEN YOU SELL

SYNEROMATIC

THE COMPLETE LINE OF
MODERN FURNACES
FOR
COAL • OIL • GAS

UNEQUALED FOR
Economy, Performance, Beauty, EASE OF
INSTALLATION AND COMPETITIVE IN PRICE

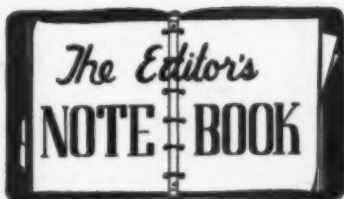


SEE OUR EXHIBIT at the Eighth
Air Conditioning Exposition,
Grand Central Palace,
New York,
Feb. 2 to 6, 1948



Syneromatic Corporation
WATERTOWN, WISCONSIN





Gas Industry

In his Presidential Address before the 29th Convention of the American Gas Association, Cleveland, Ohio, October 6, 1947, R. H. Hargrove made these comments on the gas industry's improvement programs:

"Construction expenditures of gas utilities reached a peak of \$310 million in 1946, an increase of 93 per cent over the previous year. Of this amount \$117 million was spent for natural gas transmission facilities to attempt to satisfy the great demand for this fuel in industrial areas. An estimated \$730 million will be spent by utilities for new gas facilities in 1947, with more than half of the total going into natural gas transmission. More than 320,000 miles of mains were in use by the gas utility industry at the end of 1946, a gain of 10,140 miles over 1945."

Referring to the lack of public information about the plans of the gas industry to relieve the current gas restrictions in some areas, Mr. Hargrove stated that the industry had suffered some loss of prestige because it had not told its story as promptly, completely, and effectively as it should have done. He continued:

"The public has a right to know the facts and we have a definite responsibility to supply them. Indeed, if we do not supply them we will suffer irretrievable loss of goodwill—and rightly so!

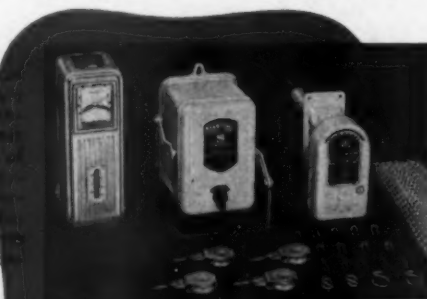
"Here then is a trouble spot that calls for immediate action lest our future progress be endangered through lack of fore-



Sampsel DAMPER CONTROL

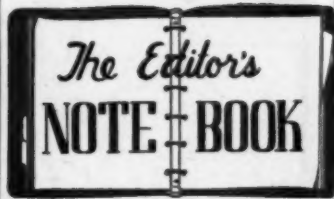
Almost 9,000,000 homes are prospects for this automatic heat . . . you can sell them Sampsel Damper Controls for healthful comfort—to save money and fuel. Sturdy, rugged construction insures years of dependable performance. Heavy duty transformer built into motor housing. Easy installation. See your jobber for details or write for catalog showing complete Sampsel line . . . Sampsel Time Control, Inc., Spring Valley, Ill.

Damper Control Package Units available with or without Warm Air Line Control and choice of Standard or Day-Night Clock Thermostat. Each kit includes all accessories needed for easy installation.



Sampsel

You can sell Sampsel Damper Control Package Units right now — during the heating season. Displays, folders, dealer kits available.



sight and resourcefulness in dealing with a purely temporary situation. Let us take the public into our confidence. The public is reasonable but must have the facts with which to reason. If any company is facing demands greater than its system can meet, let us use every channel of communication at our command to tell our customers the facts of the situation. The truth of the matter is that there is no shortage of gas and never has been. There is only a shortage of distribution and production facilities due to a shortage of materials—principally steel—with which to make pipe, compressors, gas manufacturing equipment, and other means of expanding to meet the unprecedented demand for gas service."

Five Dollars for Photos

This month's cover picture shows the public interest in a gas-fired warm air furnace in a Chicago Tribune prize winning home. Model home builders say that heating is one of the most popular subjects among model home visitors.

Our new cover provides an opportunity to display the type and quality of work being done by our industry—and an opportunity for you to see one of your own jobs in print. We will pay five dollars for some of those heating and sheet metal pictures you had taken of good looking jobs.

Address them to the Editor, AMERICAN ARTISAN, 6 N. Michigan Avenue, Chicago 2, Illinois. Photos not used will be returned.

BOOK

ness in
y tempo-
take the
ence. The
out must
which to
pany is
ter than
et us use
mmunica-
d to tell
ts of the
a of the
no short-
has been.
ortage of
action fa-
ortage of
steel—
ipe, com-
facturing
means of
the un-
for gas

photos

r picture
rest in a
rnace in
ize win-
l home
ating is
lar sub-
ome visi-

vides an
lay the
work be-
dustry—
r you to
jobs in
five dol-
heating
ures you
looking

e Editor,
6 N.
chicago 2,
sed will

**better
equipment
builds
easier
sales**

Complete with Burner



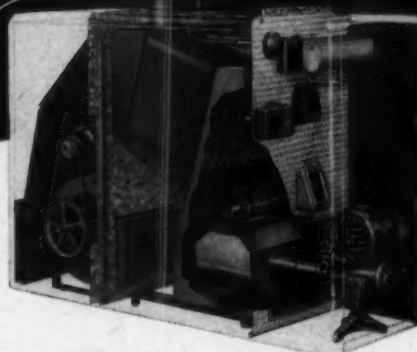
MEYER OIL-FIRED AIR CONDITIONER

Here's today's best answer to the demand for fully automatic home heating! Immediate combustion is achieved by exclusive and proven stainless steel combustion chamber. Makes installation easy! Special tubular heating element for more efficient heat interchange. Air is heated, filtered, humidified, and positively circulated. Mechanical cooling may be included at time of installation or later. WEIR-MEYER equipment is available on a profit-protecting franchise. Write — your area may be "open."

THE MEYER FURNACE COMPANY

Manufacturers of steel furnaces and air conditioners for **GAS-OIL-COAL**. Offices: Peoria 2, Ill.
Factories: Peoria and Peru, Illinois

WEIR-MEYER means modern heat



The MEYER is modern inside and out! Its stream-lined beauty is matched by its efficient performance. Heating section welded into one integral unit—no chance for any smoke or fumes to leak into the air stream.



Gas-fired Hi-boy



Gas-fired Air Conditioner



Gas-fired Gravity



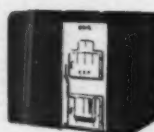
Oil-fired Hi-boy



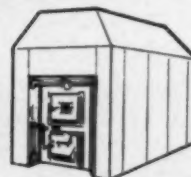
Oil-fired Air Conditioner



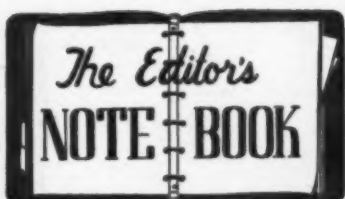
Weir Steel furnace



Coal-fired Air Conditioner



Industrial & commercial heating equipment



Gas Industry

In his Presidential Address before the 29th Convention of the American Gas Association, Cleveland, Ohio, October 6, 1947, R. H. Hargrove made these comments on the gas industry's improvement programs:

"Construction expenditures of gas utilities reached a peak of \$310 million in 1946, an increase of 93 per cent over the previous year. Of this amount \$117 million was spent for natural gas transmission facilities to attempt to satisfy the great demand for this fuel in industrial areas. An estimated \$730 million will be spent by utilities for new gas facilities in 1947, with more than half of the total going into natural gas transmission. More than 320,000 miles of mains were in use by the gas utility industry at the end of 1946, a gain of 10,140 miles over 1945."

Referring to the lack of public information about the plans of the gas industry to relieve the current gas restrictions in some areas, Mr. Hargrove stated that the industry had suffered some loss of prestige because it had not told its story as promptly, completely, and effectively as it should have done. He continued:

"The public has a right to know the facts and we have a definite responsibility to supply them. Indeed, if we do not supply them we will suffer irretrievable loss of goodwill—and rightly so!

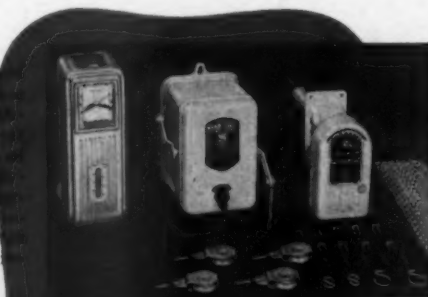
"Here then is a trouble spot that calls for immediate action lest our future progress be endangered through lack of fore-



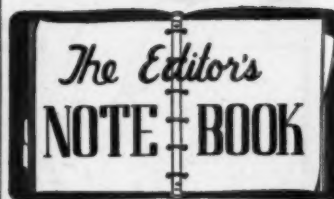
Sampsel DAMPER CONTROL

Almost 9,000,000 homes are prospects for this automatic heat . . . you can sell them Sampsel Damper Controls for healthful comfort—to save money and fuel. Sturdy, rugged construction insures years of dependable performance. Heavy duty transformer built into motor housing. Easy installation. See your jobber for details or write for catalog showing complete Sampsel line . . . Sampsel Time Control, Inc., Spring Valley, Ill.

Damper Control Package Units available without or with Warm Air Lift Control and choice of Standard or Day-Night Clock Thermostat. Each kit includes all accessories needed for easy installation.



You can sell Sampsel Damper Control Package Units right now—during the heating season. Displays, posters, dealer help sheets available.



sight and resourcefulness in dealing with a purely temporary situation. Let us take the public into our confidence. The public is reasonable but must have the facts with which to reason. If any company is facing demands greater than its system can meet, let us use every channel of communication at our command to tell our customers the facts of the situation. The truth of the matter is that there is no shortage of gas and never has been. There is only a shortage of distribution and production facilities due to a shortage of materials—principally steel—with which to make pipe, compressors, gas manufacturing equipment, and other means of expanding to meet the unprecedented demand for gas service."

Five Dollars for Photos

This month's cover picture shows the public interest in a gas-fired warm air furnace in a Chicago Tribune prize winning home. Model home builders say that heating is one of the most popular subjects among model home visitors.

Our new cover provides an opportunity to display the type and quality of work being done by our industry—and an opportunity for you to see one of your own jobs in print. We will pay five dollars for some of those heating and sheet metal pictures you had taken of good looking jobs.

Address them to the Editor, AMERICAN ARTISAN, 6 N. Michigan Avenue, Chicago 2, Illinois. Photos not used will be returned.

business in
y tempo-
take the
ence. The
but must
which to
pany is
ter than
et us use
mmunica-
d to tell
ts of the
a of the
no short-
has been.
ortage of
uction fa-
ortage of
steel—
ipe, com-
facturing
means of
the un-
for gas

photos

r picture
rest in a
rnace in
rize win-
l home
ating is
lar sub-
ome visi-

vides an
lay the
work be-
dustry—
or you to
jobs in
five dol-
heating
ures you
looking

e Editor,
6 N.
icago 2,
used will

**better
equipment
builds
easier
sales**

**AVAILABLE
NOW
Complete with Burner**



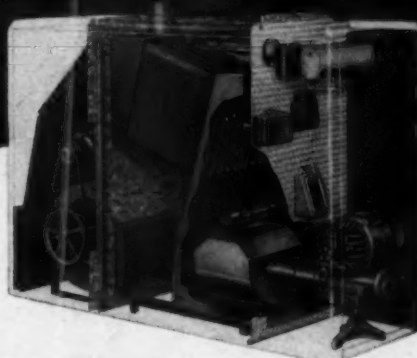
MEYER OIL-FIRED AIR CONDITIONER

Here's today's best answer to the demand for fully automatic home heating! Immediate combustion is achieved by exclusive and proven stainless steel combustion chamber. Makes installation easy! Special tubular heating element for more efficient heat interchange. Air is heated, filtered, humidified, and positively circulated. Mechanical cooling may be included at time of installation or later. WEIR-MEYER equipment is available on a profit-protecting franchise. Write — your area may be "open."

THE MEYER FURNACE COMPANY

Manufacturers of steel furnaces and air conditioners for **GAS-OIL-COAL**. Offices: Peoria 2, Ill.
Factories: Peoria and Peru, Illinois

WEIR-MEYER means modern heat



The MEYER is modern inside and out! Its stream-lined beauty is matched by its efficient performance. Heating section welded into one integral unit—no chance for any smoke or fumes to leak into the air stream.



Gas-fired
Hi-boy



Gas-fired
Air Conditioner



Gas-fired
Gravity



Oil-fired
Hi-boy



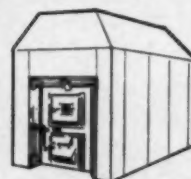
Oil-fired
Air Conditioner



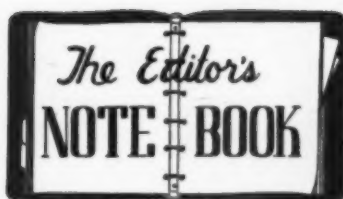
Weir
Steel furnace



Coal-fired
Air Conditioner



Industrial & commercial
heating equipment



Inflation Hardships

The worst thing about inflation is that outrageous prices make us do without so many necessities in order to be able to buy our customary luxuries. —Exchange.

Indoctrination

The indoctrination of an editor who spent most of his business life as a warm air heating and sheet metal contractor has been an experience of absorbing interest. The entire process—learning a few of the bare fundamentals about the publishing business—has been hastened by our moving to a new printing plant several months ago.

That brought about intimate association with the terms of the copywriter, proofreader, and pressroom—picas—points—stet—bleed—galley—stick up—to name but a few.

However, this has not diminished the use of the heating and sheet metal vocabulary, for it seems that cfm—btu—26 ga. 30 by 96—air distribution—double seams—and similar terms are now in more constant use than ever before.

Aluminum Duct Rigidity

Will plaster keys formed by forcing plaster through the spaces between laths tend to bend aluminum ducts inward and so reduce its effective cross-sectional area?

The Technical Advisor of Reynolds Metals Company says that aluminum is less rigid than tinned or galvanized sheet steel, thickness for thickness.



FOR THE HOME

THE ASSURANCE
OF
**DEPENDABLE
SERVICE**
BUILT IN EVERY
**MERCROID
CONTROL**

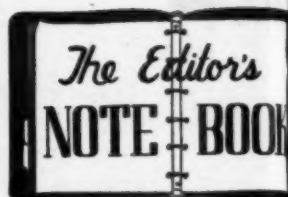
Mercoid Automatic Controls are designed for domestic oil burners and coal stokers—also for various industrial applications requiring the control of pressure, temperature, liquid level and mechanical operation.

Automatic controls are entrusted with great responsibilities. Everything depends upon their unfailing performance. Therefore, the selection of automatic controls is a matter for serious consideration. ★ With this thought in mind, Mercoid Controls invite the most critical inspection and comparison in actual field service. ★ Mercoid Controls rank first for convenience of adjustment—dependable service and long life.

**THE MERCROID
CORPORATION**

4201 Belmont Ave. Chicago 14, Ill.

FOR INDUSTRY



But equal rigidity can be obtained by going to a thickness of aluminum in the U.S.S. system that is two gauge numbers lower from that of galvanized; or by using B & S gauge that is four numbers lower than the steel gauge in the U.S.S. system.

It is evident that with the same rigidity, the plaster key will not reduce the effective cross-sectional area of an aluminum duct any more than that of a galvanized steel duct.

High Prices

Now that Congress is in session, we are hearing persuasive arguments in favor of price controls. The days of OPA are referred to with longing, sort of "those were the good old days" appeal.

Of course we all protest the current high cost of living and psychologically phrase arguments in favor of OPA are apt to find many receptive ears.

However, it must be observed that in many cases prices recorded during the OPA regime did not represent a true picture because

Many prices were kept low by subsidies paid to producers. In that way, high prices were paid out of tax

Many items in the price indexes could be bought in the black market and black market prices did not get into the indexes.

Many items reflected low quality merchandise that was available at the time. Therefore the official figures did not reflect some price increase

or's
BOOK

can be
a thick
U.S.S.
auge nu
hat of
y using
four nu
the st
system

es

gres is
earing p
in favor
he days
ed to w
those w
"appeal
protest
of liv
lly phra
or of O
many rec

ust be
many c
during
not rep
because
ere kept
id to p
way, hig
out of ta
n the p
bought
et and bl
not get

lected lo
ise that
ime. The
gures did
increase

1947

There is no such thing ...
as an Obsolete Lockformer



THE first Lock Forming Machines of our manufacture — delivered over ten years ago — are still *modern* machines — are still giving satisfactory service — day after day, year after year.

The Lockformer principle, right to start with, remains unchanged. Lockformer construction, even before many current refinements, has always provided the same "plus-factors" of strength and durability which have earned the Lockformer's reputation of being just about wear-out-proof.

Your Lockformer is a long-term *investment* — tried, proven*, and giving exceptional profit returns.

* *There are more than 11,000 Lockformers in daily use.*

**ONE MAN WITH A LOCKFORMER CAN MAKE MORE
PITTSBURGH LOCKS THAN SIXTEEN MEN
WITH EIGHT BRAKES**



THE LOCKFORMER CO.

4615 ARTHINGTON STREET • CHICAGO 44, ILLINOIS

The Editor's NOTE BOOK

January Directory

In our January issue we will continue our practice of publishing a Directory Section. Since 1934, this issue has been a standard up-to-date buying reference for dealers, contractors, wholesalers, and manufacturers.

This year a special Show Section will cover all exhibitors at the Eighth International Heating, Ventilating, and Air Conditioning Exposition in New York, February 2 to 7, including personnel in attendance.

The editorial content—added to the Directory and Show Sections—will provide cover-to-cover reference throughout 1948.

Radiant Heating Analysis

In A. M. Byers Company's booklet titled "What We Have Learned from 1000 Radiant Heating Installations," 47 per cent of the radiant systems analyzed are listed as residential installations in homes ranging in price from \$5,000 to \$100,000; 28 per cent in commercial buildings; 16 per cent, industrial; 8 per cent, institutional; and 1 per cent, miscellaneous.

Floor radiant heating predominated, accounting for 93 per cent of the installations included in the study. More than 90 per cent are heated by coils embedded in concrete floor slabs. Many types of floor coverings were observed: hardwood flooring, linoleum, asphalt and rubber tile; mosaic, marble and quarry tile; terrazzo, cement mixtures, rugs, and carpeting.

The booklet points out that floor slabs were impossible to

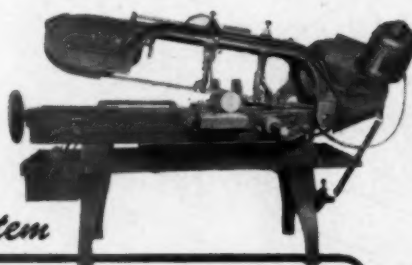
TWO FINE...

Metal Cutting Saws

FOR PRODUCTION AND GENERAL UTILITY

WELLS No. 8

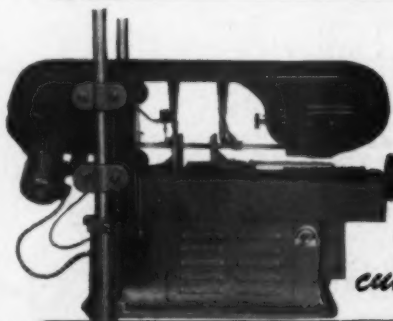
with wet
cutting system



Here's a saw that will pay dividends on practically any cut-off job. It's fast, versatile and economical. The wet cutting system illustrated is a low cost extra that makes possible higher cutting speeds and longer blade life.

Specifications

CAPACITY: Rectangular 8' x 16'
Special Guides 5' x 24'
Rounds 8" O. D.
MOTOR 1/2 H. P., A. C., or D. C.
SPEEDS Selective; 60, 90, 130 feet per minute
WEIGHT Approximately 665 pounds



WELLS No. 12

with
automatic
cutting cycle

The new Wells No. 12 is an electrically powered, hydraulically controlled saw. Just push a button and the head comes down and makes the cut at a controlled blade pressure. At the completion of the cut the head returns to a predetermined position and the motors shut off.

Specifications

CAPACITY: Rectangular 12' x 16'
Rounds 12 3/4" O. D.
MOTORS 3/4 H. P. and 1/2 H. P.
SPEEDS Selective; 50, 90, 150 feet per minute
WEIGHT Approximately 1750 pounds

Wells

Products by Wells are Practical

METAL CUTTING BAND SAWS

WELLS MANUFACTURING CORPORATION
1819 WILSON AVE., THREE RIVERS, MICHIGAN

The Editor's NOTE BOOK

heat by conventional means, and so were little used except in utility and industrial buildings.

Agricultural Income

Rich Kansas soil is expected to yield nearly two billion dollars worth of farm and mineral products this year.

The value of the state's crops, minerals, and livestock will be 500 million dollars greater than in 1946. Banks are swollen with cash. Producers have become increasingly aware of Federal taxes.

All this points to the unprecedented agricultural income today, a situation which is practically nation-wide.

Contractors with rural areas should not overlook the farmer in their sales, advertising, and direct mail programs. He too, wishes to improve his standards and comforts. Expansion of your market area now will pay off in stabilized rural business in the future.

Mailing Envelopes

Did you notice last month we started mailing AMERICAN ARTISAN in an envelope—flat? Our circulation department tells us the old method of mailing—rolled up—has been discontinued.

It seems that a rolled-up copy would take on a permanent curl by the time it reached its destination. About two weeks under an unabridged dictionary were required to remove the permanent.

Too bad "the Missus" can't roll up her hair in that manner and ship it around the country and take advantage of such a low-priced permanent.

HELP!

YOU GET HELP—and plenty of it—when you do business with Rheem!

Rheem *helps* dealers and jobbers—by delivering actual *names* of prospects for heating appliances!

Every month Rheem national advertising reaches millions of people. Every ad carries a coupon or offer of literature. Each inquiry is answered with the recommendation that the prospective customer write his nearest Rheem dealer.

An interested prospect is half the sale!

That's why Rheem *helps* you with national advertising that produces results, merchandising aids that convince prospects at the point of sale.

That's why Rheem helps make it easy for you to buy. You can get a complete line of heating appliances through one source, with immediate de-

livery on your orders . . . you can buy mixed carload lots, today's way of distributing merchandise most effectively and economically.

And that's why Rheem offers the Dealer Floor-Finance Plan, to help dealers stock a complete line, for only a 10% cash down payment.

In other words Rheem *helps* you to move merchandise out the front door, not just in the back door.

It's easy—and profitable—to sell behind this support. Mail the coupon today and find out more about this profitable opportunity.

Rheem

Rheem
R

MANUFACTURING COMPANY

All Gas Appliances are Approved by the American Gas Association. All Electric Appliances are Approved by Underwriters' Laboratories Inc.



RHEEM

Dept. No. R F-6

570 Lexington Avenue, New York 22, N. Y.

Please tell me more about Rheem.

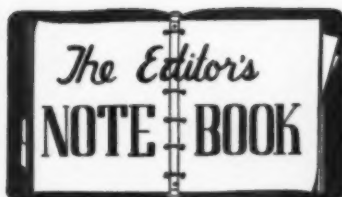
NAME

COMPANY

ADDRESS

CITY

STATE



Oil Burner Installations

During the annual fall meeting of the Empire State Petroleum Association, A. L. Nickerson of the Socony-Vacuum Oil Company, told his audience it was the feeling of his company that it was unwise for the industry to encourage further conversions to oil from other fuels.

"In this area," Mr. Nickerson said, "the terrific increase in the rate of new burner installations is, in large measure, responsible for our whole fuel supply problem. This rate must be reduced through a realization on the part of the consuming public that a new oil burner does not carry with it an assured source of supply."

B. L. Majewski of the Deep Rock Oil Corporation and Chairman of the American Petroleum Institute Marketing Committee, followed Mr. Nickerson and pointed out that he could see no justice in singling out oil burners to be limited in fuel supply in the present planning in production of burning oils. He reminded his audience that in the past they had been very glad to have this business, would be glad to have it in the future, and would be well advised to plan to take care of it in the present. Further, he suggested that if sections of the industry, such as oil heating equipment, were to be limited, it was about time to give consideration to asking Detroit that automobiles requiring high octane gas should not be produced now. He advanced the thought that gasolines of the comparatively lower but satisfactory octane

Mr. Dealer!

HOW LONG SINCE YOU'VE SEEN A SURE PROFIT-MAKING DEAL LIKE THIS?

IT'S A BIG PROFIT MAKER — The Raytheon Home Precipitator nets you a substantial profit . . . far more than most home appliances. And you can count on frequent sales because . . .

IT'S IN DEMAND — This amazing new electronic air cleaner offers your customers a healthier, cleaner, more comfortable home atmosphere . . . dust-free, pollen-free, smoke-free air . . . extra leisure, lower cleaning costs, — all for about 6 cents per day. Start telling this potent sales story now because . . .

IT'S AVAILABLE — Raytheon Home Precipitators are now moving off our assembly lines ready for prompt delivery through your distributor. Get the whole story now because the Raytheon Home Precipitator has . . .

UNLIMITED SALES POSSIBILITIES — It's a year-round seller — as well as a big heating season item. And not only can you sell it to the tremendous new housing market, but to your present prospects and old customers. *Every user of warm air heating and/or air conditioning — old or new — is a prospect.*

GET THE COMPLETE STORY TODAY

Write, wire or phone today to the nearest Raytheon district office. Ask for complete information on this volume and profit opportunity-of-a-lifetime and for the name of the distributor in your territory.

ATTENTION DISTRIBUTORS

A few rich territories are still open to high grade, live-wire distributors. Immediate action may save your valuable territory for you. Get in touch with the nearest district office or Raytheon, Waltham. Don't delay.

RAYTHEON MANUFACTURING COMPANY
Commercial Products Division • **Waltham 54, Mass.**
Waltham 5-5860



ATLANTA
Raytheon Manufacturing Co.
306 Candler Building
Lamar 6791

CHICAGO
Raytheon Manufacturing Co.
222 W. Adams St.
Rm. 7457

CLEVELAND
Raytheon Manufacturing Co.
902 Hanna Building
Main 3730

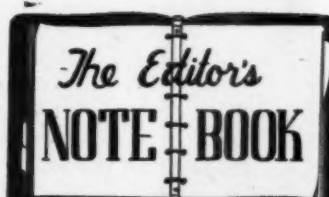
DETROIT
Raytheon Manufacturing Co.
6432 Cass Avenue
Madison 6300

NEW YORK
Raytheon Manufacturing Co.
60 East 42nd St.
Murray Hill 2-7440

WASHINGTON, D. C.
Raytheon Manufacturing Co.
Republic 5897

RAYTHEON

Excellence in Electronics



rating were good enough and if gasoline runs were confined to that octane level, productive capacity of refineries would step up. Mr. Majewski's remarks were applauded.

Bookkeeping

You often suggest that readers should not hesitate writing about their problems and I have one that I am sure comes under management of the warm air heating business.

I would like to ask if you can suggest an efficient but simple bookkeeping system for the warm air heating business — something not too costly.

Of course, I can get a system set up locally, but it would be complicated and rather expensive for a small business like this.

R. C. SNYDER

Crestline, Ohio.

We understand the Sheet Metal Contractors' National Association will soon be ready to distribute a simplified bookkeeping system to both members and non-members. The system includes ledgers and all necessary forms for one year's operation. Provision is made for recording all taxes and payroll items normally encountered in operating a warm air heating or sheet metal business.

You can get complete details of this system from J. D. Wilder, Executive Secretary of the association, 170 Division Street, Elgin, Illinois.—ED.

OK

gh and
re con-
el, pro-
fineries
Majew-
lauded.

at read-
writing
and I
e comes
of the
ess.

if you
nt but
em for
usiness
tly.

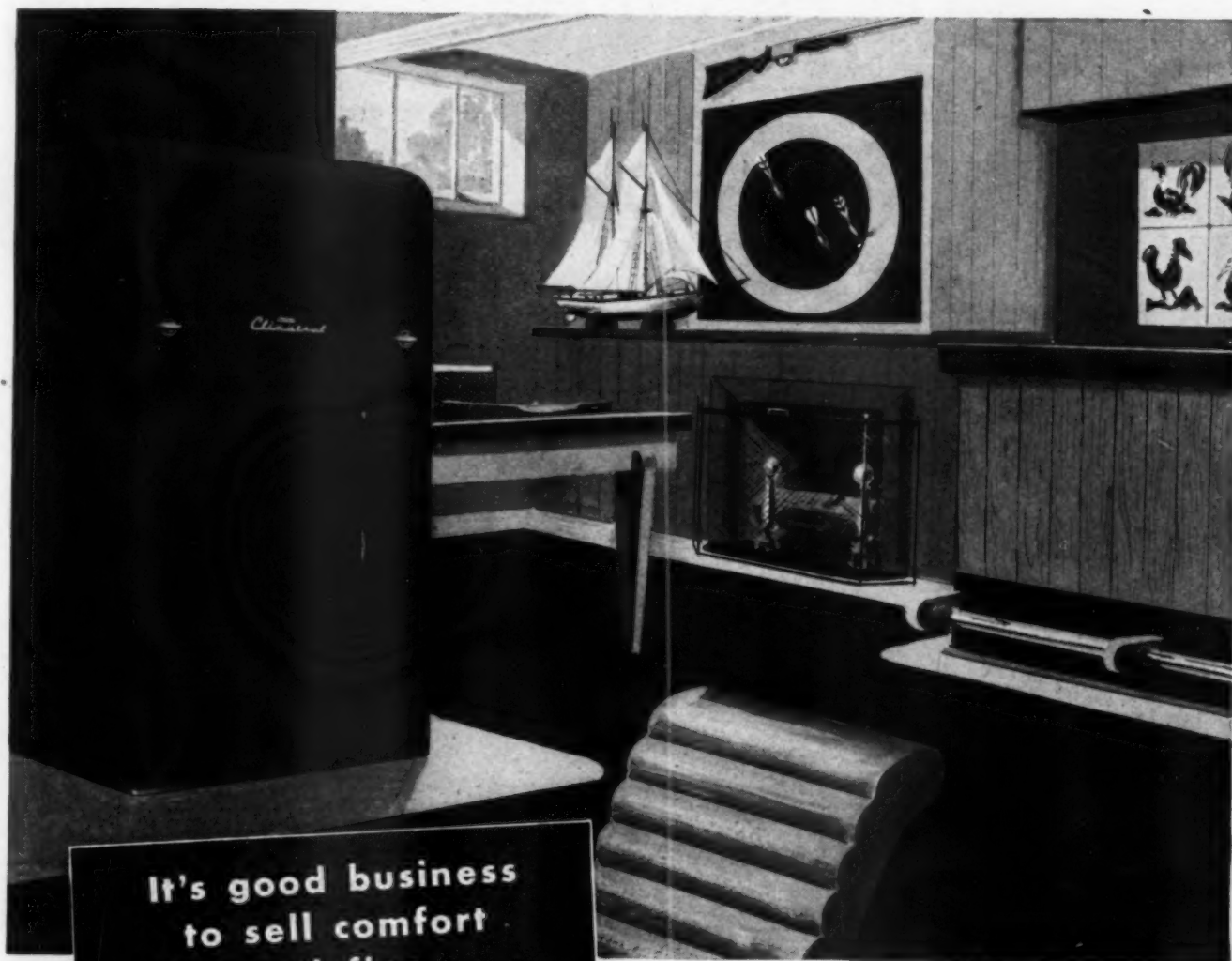
a sys-
would
ner ex-
usiness

YDER

Sheet
ational
ready
book-
mem-
The
and all
year's
made
s and
y en-
ng a
sheet

te de-
J. D.
retary
Divi-
ois.—

947



It's good business
to sell comfort
that satisfies . . .

and satisfaction is certain with Mueller Climatrol

Yes — Climatrol's *True Indoor Comfort* pays annual dividends of good-will from satisfied customers — a valuable asset for your business future.

As a Climatrol Comfort Merchant, you can expect a good share of the expanding modernization and new-building market in your area. The complete Mueller Climatrol line enables you to supply the right size and type for every requirement — each model specially engineered for efficiency with a specific fuel—gas, oil, or coal. Climatrol's smart,

new styling is just what today's homeowners want for their modern basements.

Your selling effort is supported by Mueller's strong national advertising campaign — every installation you make is backed by Mueller's 90-year performance record. More and more home-owners choose "climate-control" for True Indoor Comfort — that's why it pays to sell Climatrol! Write for bulletins. *L. J. Mueller Furnace Co., 2010 West Oklahoma Avenue, Milwaukee 7, Wisconsin.*

MUELLER

Climatrol

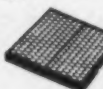
REG. U. S. PAT. OFF.





*Have You Changed
Furnace Filters
Lately?*

**GET MORE HEAT...
SAVE FUEL...MONEY**



...with clean, new
air filters in your
warm-air furnace!

● If you looked at them—or even thought of all the dust and lint they've been collecting since (just when were they last changed?)—you'd have those dirt-clogged filters replaced immediately.

New Dust-Stop® Air Filters cost but little, save fuel and money by permitting clean, heated air to circulate freely. They also protect your decorations and furnishings from the ravages of atmospheric dust. This cleanliness, as you well know, is one of the biggest advantages of modern warm-air heat.

Phone your dealer for new, clean Dust-Stops today. A product of Owens-Corning Fiberglas Corporation, Toledo 1, Ohio.
In Canada, Fiberglas Canada Ltd., Toronto, Ontario.



DUST-STOP®

AIR FILTERS
—a FIBERGLAS Product



OWENS-CORNING FIBERGLAS CORPORATION

"Your partner whose Actions speak louder than words"

Watch for this Girl

IN



(JANUARY ISSUES)

SHE'S SELLING...

2 BIG IDEAS FOR YOU

● Reaching 9,500,000 readers of these popular home service publications! Selling *winter* replacement of DUST-STOP® Air Filters. Selling increased satisfaction with warm air heating.

More winter replacement business means greater profits for you through increased DUST-STOP Filter sales. But more than that, it's your lead-in to *extra* profitable service business.

She's selling satisfaction by reminding owners that their units are more efficient when filters are clean. And satisfied owners are one of our industry's greatest assets—a hearty word of praise from your prospect's friend or neighbor carries strong selling power.

Make the most of this profit-building opportunity. Tie in today with a telephone campaign, or with direct mail. Ask your distributor for a supply of timely mailing cards (Form No. D47-20) or write direct for your copy of "BRINGING IN NEW BUSINESS BY PHONE" (Form No. D47-35). Both are *free*. Owens-Corning Fiberglas Corporation, Dept. 930, Toledo 1, O.

In Canada: Fiberglas Canada Ltd., Toronto, Ontario.

®T. M. Reg. U. S. Pat. Off.



CENTURY PRODUCTION IS MANY TIMES PRE-WAR LEVEL



MODEL "R" OIL-FIRED FURNACE
Century Oil-Fired Hot Water Boilers
and Hot Water Heaters in a wide range
of sizes will be available during 1948.

Century Has Never Let a Dealer Down!

Since the war, even when materials have been most difficult to obtain, Century has met its commitments to its dealers.

When electric motors were unobtainable, Century purchased an entire manufacturing plant. This is just one of the ways Century has kept a steady flow of oil-burning equipment going out to dealers all over the nation.

Century now looks forward to an even greater 1948, when the Complete Century Line will become available. Backed by 21 years of manufacturing experience, Century has been quick to employ modern production methods. Century takes pride in its products . . . the "best in oil-fired heating equipment" . . . available to all its loyal dealers.

A few choice Century Exclusive-Area Dealer Franchises are now available. Inquire about your territory, now!

CENTURY
Engineering Corporation
CEDAR RAPIDS, IOWA

OIL BURNERS
HUMIDIFIERS

BOILER-BURNER UNITS
WATER HEATERS

WARM AIR FURNACES
AIR CONDITIONING

MEMO: To Sheet Metal Shops

*If you can work galvanized steel—
you can work Stainless Steel*

...and with the same equipment!

BECAUSE it adds beauty, endurance, corrosion resistance and long life wherever used, Stainless Steel—and particularly U·S·S Stainless—is being specified for more and more equipment.

Alert, up-to-date sheet metal shops are cashing in on this popular preference for Stainless. They are finding it easy to turn out Stainless jobs on *the same shop equipment* that they are using to fabricate galvanized steel.

The only difference in working with Stainless is a slightly different fabricating *procedure* that is not difficult to set up or hard to master.

Because of its uniformity in composition, in finish and fabricating quality, you will find perfected U·S·S Stainless is readily fabricated into A-1 jobs that practically guarantee customer satisfaction.

To help you take advantage of the large and continually increasing demand for jobs in Stainless Steel—to help you turn out *quality* work that will enhance your reputation and bring you more business, write for our book—"Fabrication of U·S·S Stainless and Heat Resisting Steels." Use it with confidence as a practical guide to produce the best-selling, most profitable jobs your shop has ever done.



U·S·S STAINLESS STEEL

SHEETS · STRIP · PLATES · BARS · BILLETS · PIPE · TUBES · WIRE · SPECIAL SECTIONS



7-789

UNITED STATES STEEL

AMERICAN STEEL & WIRE COMPANY, Cleveland, Chicago & New York
CARNEGIE-ILLINOIS STEEL CORPORATION, Pittsburgh & Chicago · COLUMBIA STEEL COMPANY, San Francisco
NATIONAL TUBE COMPANY, Pittsburgh · TENNESSEE COAL, IRON & RAILROAD COMPANY, Birmingham
UNITED STATES STEEL SUPPLY COMPANY (Warehouse Distributors), Chicago : UNITED STATES STEEL EXPORT COMPANY, New York

NO

*-Hot Spots!
-Cold Spots!
-Vertical
Joints!*



SERIES CA

LUXAIRE'S NEW CAST IRON ★ GAS FIRED AIR CONDITIONING UNIT

Hot Spots! Cold Spots! Vertical Joints! The "bug-a-boos" in cast iron heating equipment have been eliminated by the ingenuity and know-how of Luxaire in their new, cast iron, gas fired heating equipment.

There are no hot spots—

There are no cold spots—

There are no major vertical joints in the heating element assembly of these new units.

You'll sell heating equipment that has passed all the new high and low temperature requirements of the American Gas Association.

You'll sell heating equipment with distinctive installation, inspection, and servicing features—heating equipment that will give long years of trouble-free service.

(Write for new, colorful, illustrated literature)

THE C.A. OLSEN MANUFACTURING COMPANY

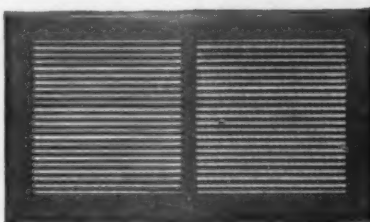
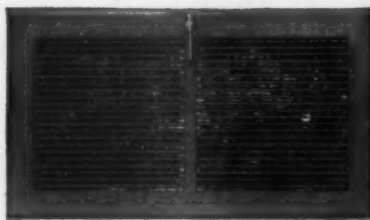
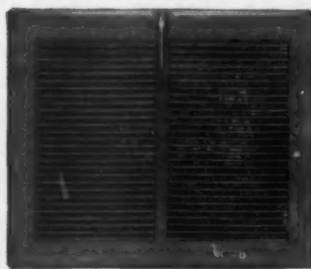
Luxaire



HEATING & AIR CONDITIONING UNITS

Char-Gale

REGISTERS



Char-Gale registers are designed for the modern house. Their quiet good looks are in harmony with today's architecture and furniture; they are engineered for maximum efficiency. Char-Gale means high quality, yet modern production methods make Char-Gale quality available for the mass market.

Registers are the visible part of your installation, proclaiming your workmanship in every room of the house. To make sure that your registers give a favorable report of you, install Char-Gale.

Take no chances; specify "Char-Gale" to your jobber



Minneapolis

CHAR-GALE MFG. CO.

Omaha

**BUILT
WITH CARE**

**SHOWN
WITH PRIDE**

**SOLD
WITH
CONFIDENCE**

Another Product of
CHAR-GALE Metal
Craftsmen

Who Also
Produce the Finest
in ALUMINUM
fittings



The completeness of the Victor FIN Furnace line is a money making asset to any dealer—add to this the known high quality of VICTOR furnaces, famous since 1890, and you have a line which takes you out of the competitive class . . . a real sales and profit building line for 1948.

Write us . . . investigate VICTOR NOW!

and to you . . .

Greetings of the Season

SUCCESSFUL FURNACE BUILDERS FOR OVER A HALF OF A CENTURY • WRITE FOR DEALER INFORMATION

HALL-NEAL FURNACE Co.

VICTOR Quality Furnaces Since 1890

1322 N. CAPITOL AVENUE • INDIANAPOLIS 7, INDIANA

New RYBOLT Units

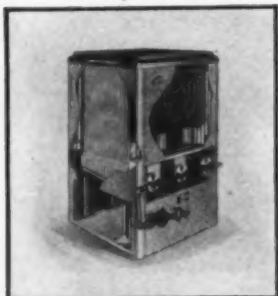
IN STEEL AND CAST IRON



*Rybolt Series 15
Cast Iron Coal Fired
Gravity Furnace*



*Rybolt Series RH 71
Steel Coal-Fired
Gravity Furnace*



*Rybolt Series RG 53
Cast Gas-Fired
Gravity Furnace*



*Rybolt Series RG 54
Cast Gas-Fired
Winter Air Conditioner*

These RYBOLT heating units in steel and cast iron, fired by coal and gas, represent a line that will give the dealer a big advantage in securing his share of the heating business.

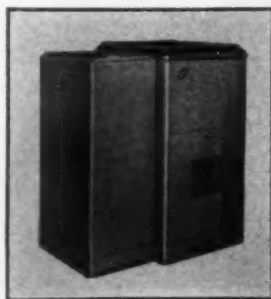
With one exception, Series 15, these units are completely new with advanced features that are sound and practical yet register a soaring high in modern heating engineering development—compact, efficient, dependable and economical.

Series 15 RYBOLT cast iron, coal fired furnace retains the fundamental features that has made this standby famous. Yet to this model also have been added important new improvements and refinements that make it a decidedly better and more saleable furnace.

There's a big market ahead for dependable home heating units. Send in your order now to make sure of having ample stock on hand.



*Rybolt Series 152
Cast Coal-Fired
Winter Air Conditioner*



*Rybolt Series RG 58
Cast Iron Gas-Fired
Winter Air Conditioner*



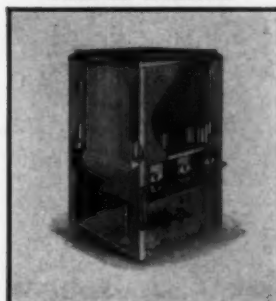
*Rybolt Series RH 76
Steel Coal-Fired
Winter Air Conditioner*



*Rybolt Series RG 56
Steel Gas-Fired
Winter Air Conditioner*



*Rybolt Series RG 52
Steel Gas-Fired
Winter Air Conditioner*



*Rybolt Series RG 51
Steel Gas-Fired
Gravity Furnace*



THE RYBOLT HEATER COMPANY

615 MILLER STREET



ASHLAND, OHIO



*Magic Dial... the World's
Finest Clock Thermostat*

PERFEX
TWIN CONTACT CONTROLS
PERFEX CORPORATION, MILWAUKEE 7, WISCONSIN
Perfex Controls Ltd., Toronto 1, Ontario, Canada

AIR CONTROL *Presents*

THE GREATEST IMPROVEMENT IN REGISTER VALVE MECHANISM IN THE LAST DECADE

PUSH BUTTON CONTROL

(PATENTS PENDING)

*The Modern Method
of Register Operation*



AIR CONTROL'S Engineering has developed the greatest advancement in register design in years — modern registers that operate as easily as your push button radio. No. 10 Series Registers — unequaled in the control of air distribution *both* horizontally and vertically — are now available with PUSH BUTTON Control.

Air Control's No. 10 Series Registers have many new innovations — the new Recessed Design face enhanced by the attractive push buttons — adds new beauty to this outstanding line of registers. Available in the new satin sheen Beige prime coat. This attractive finish harmonizes with modern decorations—it can be used as finished or repainted as desired.

A Positive Foolproof Mechanism

The PUSH BUTTON control operates so easily — yet it has *only four moving parts!* You'll have foolproof operation with this mechanism. It's positive and dependable — no friction parts to wear — no screws to adjust — this mechanism will operate perfectly after twenty years of service. Just push a button to open or close the valve — you don't pull the register off the wall trying to free sticking levers.

A coil spring adds extra snap to the push button action — the valve snaps tightly closed or open. An adjustable stop (located below the buttons) predetermines the open position of the horizontal louvered valve — providing any desired air deflection — up, down or straight.

Your AIR CONTROL Jobber will show you this register today. See your AIR CONTROL Jobber or write for complete information and samples.

Builders of —

AIR CONTROL Registers, Grilles, Stackhead Dampers, Etc., for every heating and Air Conditioning need. LEIGH Building Products for more livable homes.

AIR CONTROL PRODUCTS, INC.
COOPERSVILLE MICHIGAN



It's Brand New- It's Years Ahead **MONCRIEF'S**

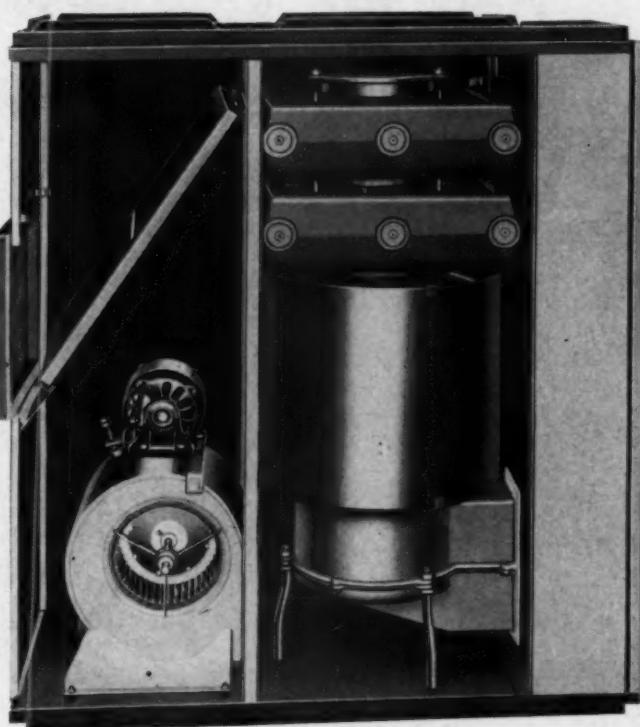


Cast Iron • Gas Fired Air Conditioning Unit

Yes it's new—it's brand new from top to bottom—from end to end.

- The Combustion chamber rugged and long lived—no hot spots—no cold spots.
- The One Piece Radiator with clean-out ports and "non-freeze" port covers.
- The tight, compact cabinet, easy to assemble, with advanced features for servicing just the radiator or the entire heating element.

These units are truly "years ahead" in design, construction and operating efficiency.



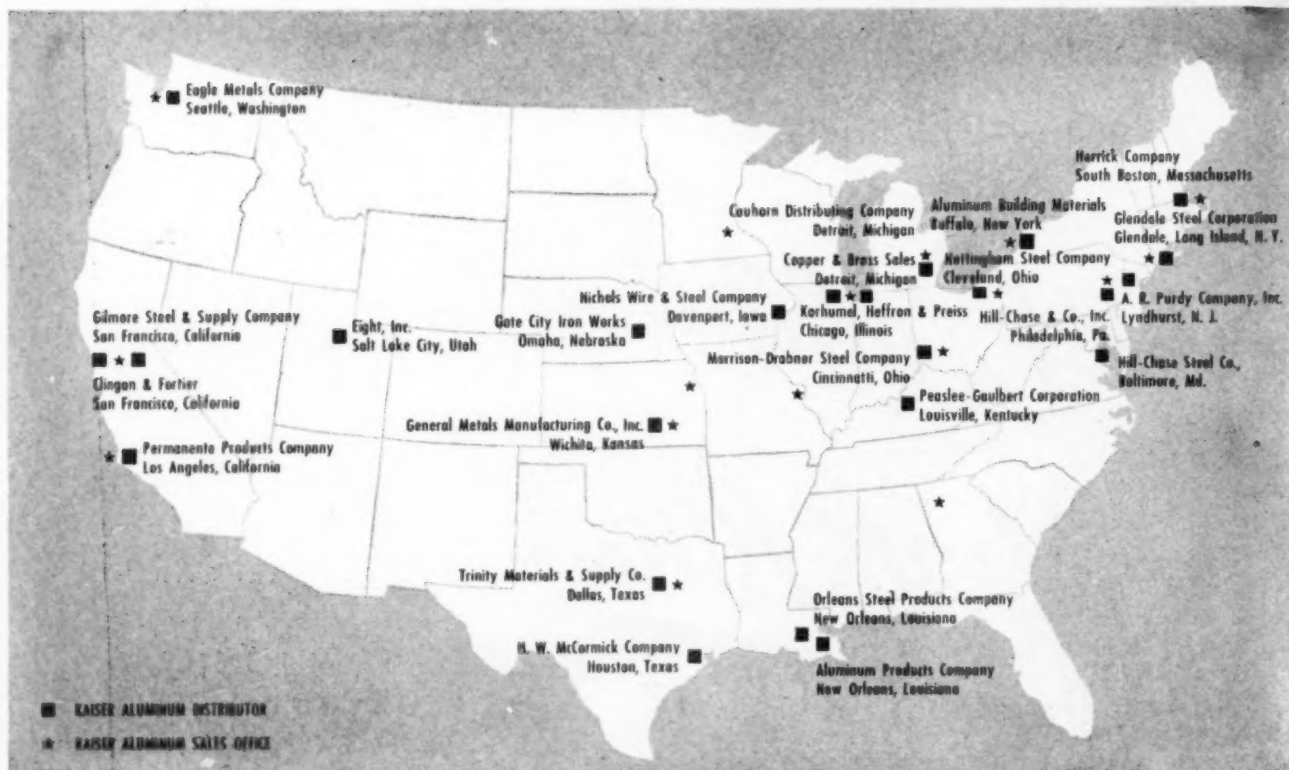
THE HENRY FURNACE COMPANY

Medina, Ohio

HEATING AND AIR CONDITIONING UNITS



FURNACE PIPE AND FITTINGS



Here are your new supply points for Kaiser Aluminum

23 CONVENIENTLY LOCATED DISTRIBUTORS OFFER KAISER
ALUMINUM SHEET, PLATE, STRIP, COIL, CIRCLES, ROOFING AND
SIDING . . . IN LESS THAN CARLOAD LOTS

Now you can be certain of a close-up source of Kaiser Aluminum . . . *wherever you are located.*

Permanente Products Company is proud to announce the appointment of 23 of the finest

material supply houses in the country as distributors of Kaiser Aluminum.

Your local distributor offers complete warehouse stocks of Kaiser Aluminum to meet your immediate needs. No longer need you

wait for small carry-over stocks . . . for your local distributor sells in less than carload lots!

This new nationwide network of distributors is in addition, of course, to Permanente Products' 19 sales offices, each ready to help you in solving your engineering problems.

Which means that Permanente Products . . . in only a little over a year of operation . . . now completely rounds out its service facilities . . . to bring you more and better aluminum—*faster!*

Ready to serve you—today . . . 23 conveniently located

Kaiser Aluminum Distributors

PERMANENTE PRODUCTS COMPANY, KAISER BUILDING, OAKLAND 12, CALIFORNIA . . . WITH OFFICES IN:
Seattle • Oakland • Los Angeles • Dallas • Wichita • Kansas City • St. Louis • Atlanta • Minneapolis • Milwaukee • Chicago
Cincinnati • Cleveland • Detroit • Boston • Buffalo • New York City • Philadelphia • Washington, D. C.

Peace on Earth

Jackson & Church Company extends the sincere wish that among the blessings of a joyous yuletide, these in particular will be yours: the pleasure of genuine friendship . . . the opportunity to make others happy . . . the joy of giving . . . the appreciation of Christmas in all its glory.



During this happy holiday season peace of mind is yours if you have been specifying and installing the famous J & C warm air furnaces.

You'll know that J & C equipment has made others as comfortable as you . . . that you have furnished superior installations and contributed your best to a warm and pleasant Christmas for others.

Best Wishes for a Prosperous New Year.

JACKSON & CHURCH COMPANY, SAGINAW, MICHIGAN



WORK WELL DONE SINCE '81

MONTH AFTER MONTH...

PETRO

beams sales messages
to your oil burner* prospects!

MILLIONS OF HOMES the country over. That's the big oil burner market Petro national advertising reaches every month. Again and again, these result-getting messages hit home—hard!

Only magazines and newspapers of wide acceptance among homeowners are used. Through these publications, the story of Petro's cost-saving reliability is beamed constantly to the people *you* want to reach... all the worthwhile oil burner prospects in *your* area. Building up a preference for Petro. Selling *your* services as a leading heating contractor in your community.

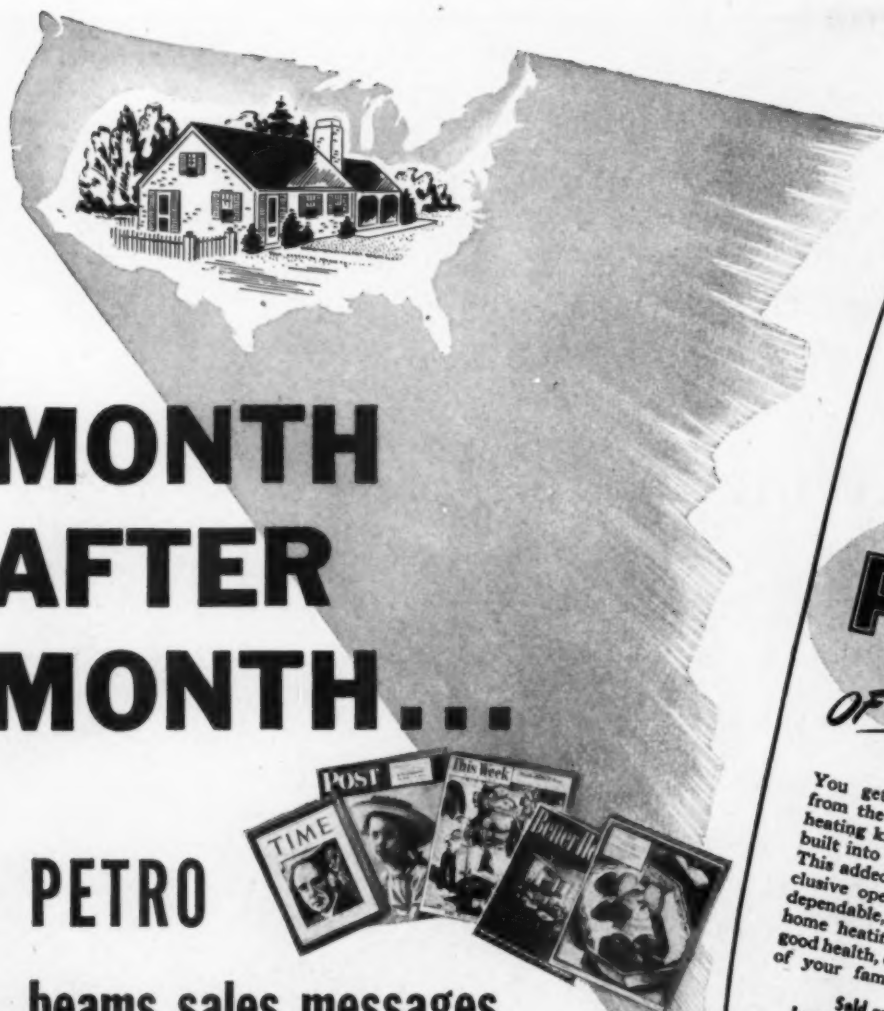
Profit from this effective promotion! Plan on *more* oil heating business with Petro. Sold through established heating and plumbing jobbers. See the Petro distributor in your wholesale trading area... now!

**And to your prospects for boiler-burner units, furnace-burner units, and water heaters.*

PETROLEUM HEAT AND POWER COMPANY • STAMFORD, CONNECTICUT

Makers of Good Oil Burning Equipment Since 1903

Petro Refineries in: CORPUS CHRISTI AND PORT ISABEL, TEXAS. Fuel Oil Bulk Plants and Distribution Terminals in: BOSTON • PROVIDENCE
STAMFORD • MT. VERNON • NEW YORK • MINEOLA • BROOKLYN • NEWARK • PHILADELPHIA • BALTIMORE • WASHINGTON • CHICAGO



**WHAT
OIL BURNER**
has built into it
more than 40 years'
oil heating "know-how"?

PETRO
REG. U.S. PAT. OFF.

OF COURSE!

You get significant extra value from the more than 40 years' oil heating knowledge and experience built into every Petro Oil Burner. This added value, plus Petro's exclusive operating features, assures dependable, low-cost, automatic home heating so essential to the good health, comfort and happiness of your family year after year.

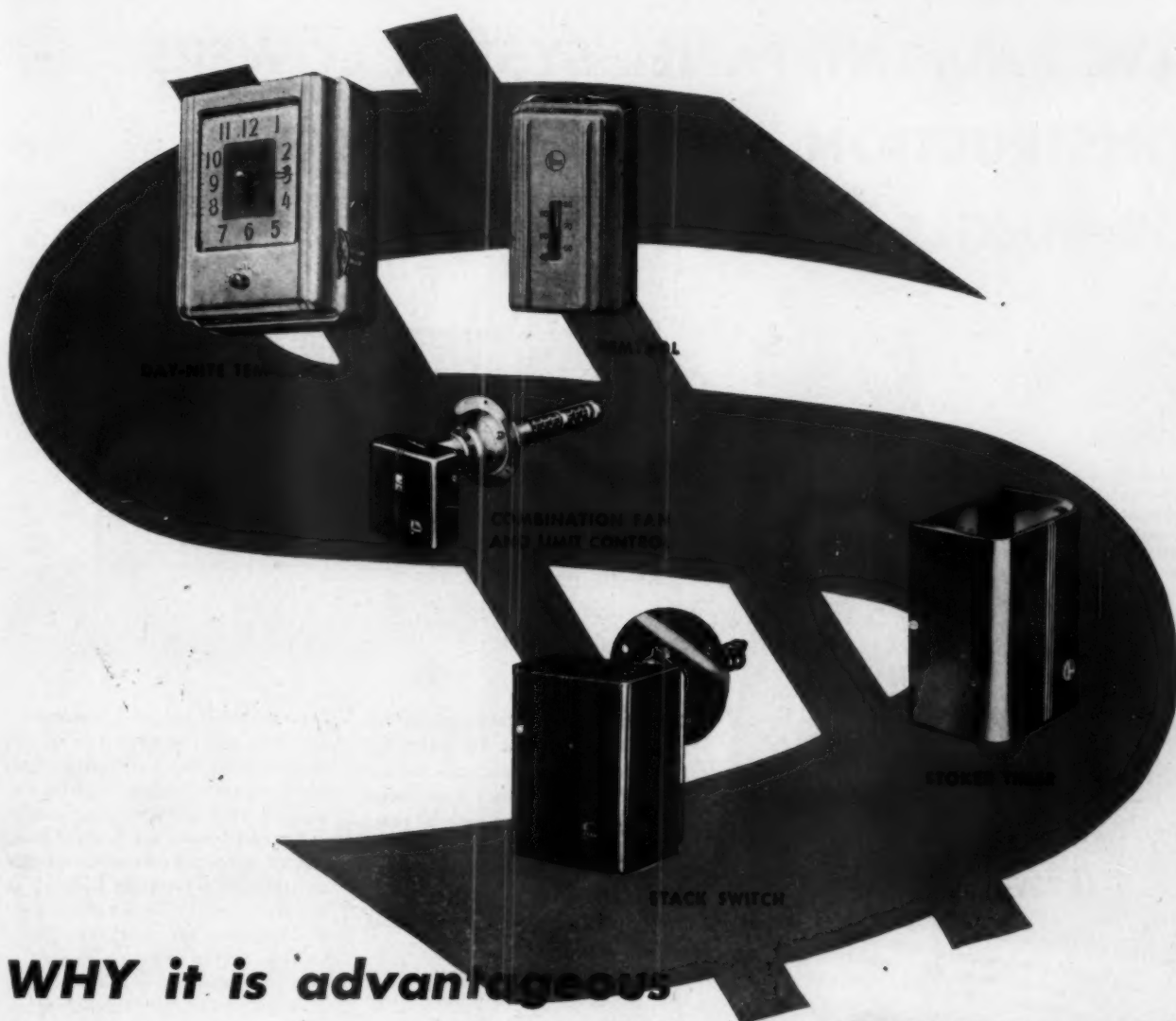
Sold and installed by
heating contractors everywhere

**PETROLEUM
HEAT and POWER CO.**
Stamford, Conn.

*Since 1903 — Makers of fine oil heating
equipment for home and industry*

PETRO
REG. U.S. PAT. OFF.

OIL BURNERS • BOILER-BURNER UNITS
FURNACE-BURNER UNITS • WATER HEATERS



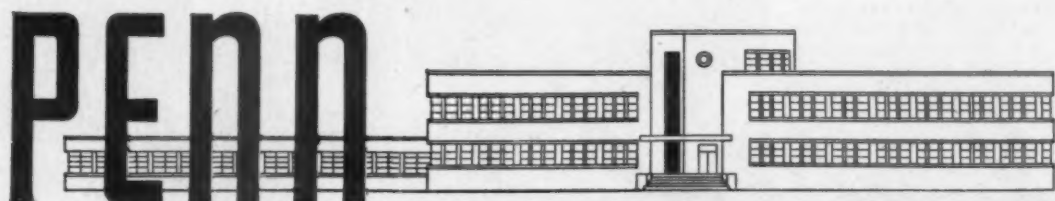
WHY it is advantageous to sell PENN Controls

Penn two-wire construction makes installation simple and easy . . . saving time and money. Then, customer-appreciated features win and maintain the buyer's acceptance and satisfaction. Take PENN Tem-Clock, for instance. This control provides *fully automatic control* of night set-back temperature . . . resulting in greater *comfort*, greater *convenience* and greater *fuel economy*. It can be installed in any room desired by the purchaser, *regardless of the location of the thermostat*.

Then, there's PENN Temtrol, the thermostat with *the heat-anticipating feature*. It as-

ures true heating comfort by keeping room temperatures extremely close to the selected level.

"Extras" like these are found in all PENN heating controls—primary controls, limit controls and relays. Remember, in PENN Controls, you get *extra* dependability, *extra* efficiency, *extra* accuracy and *extra* ease of installation. For customer satisfaction . . . specify PENN. Penn Electric Switch Co., Goshen, Indiana. In Canada: Penn Controls Ltd., Toronto, Ont. *Export Division: 13 E. 40th St., New York 16, U. S. A.*

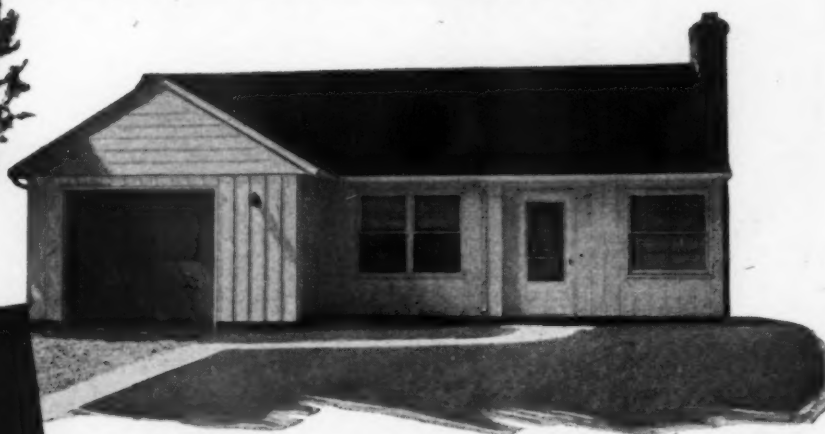


AUTOMATIC CONTROLS

FOR HEATING, REFRIGERATION, AIR CONDITIONING, ENGINES, PUMPS AND AIR COMPRESSORS

NEW RADIANT PANEL SYSTEM LOWERS CONSTRUCTION AND HEATING COSTS FOR SINGLE FLOOR-PLAN HOUSES

One of 80 three-bedroom houses of the Kew Garden project designed by Mellenbrook, Foley & Scott and built at Berea, Ohio, suburb of Cleveland, by Taft and Blackman.

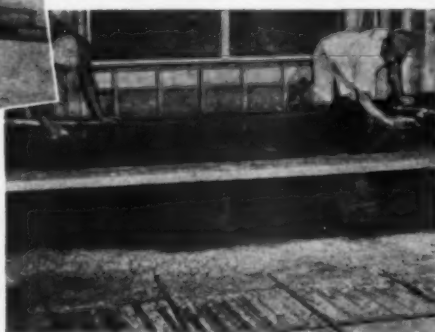


Typical floor plan; note location of the compact Janitrol Winter Air Conditioner in the combination kitchen-utility room.



Beginning of floor construction, two tiers of bricks are laid on concrete slab to form heat distribution ducts 3½" deep.

Pouring concrete over corrugated sheet steel above the duct tiers on which reinforcing bars are supported.



● There's no guesswork about the results of these 80 warm air radiant heating installations, for many of these homes have been occupied for more than a year.

The system which employs a Janitrol Winter Air Conditioner, works beautifully and the home owners are immensely enthusiastic.

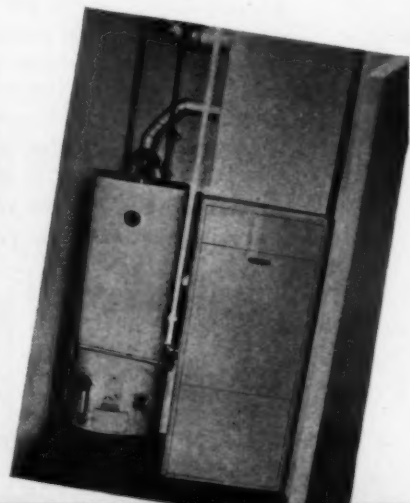
All of the floor area, except the garage, of these one floor type houses is radiant panel heated. The Janitrol gas-fired 105,000 Btu Winter Air Conditioner is located in the combination kitchen-utility room. See floor plan at the left.

In addition to the solid com-

fort supplied by quiet, automatic Janitrol heat, installation of the unit and house construction costs were materially lowered by the unique heat distribution system.

Forced warm air is first conducted upward to the attic and then distributed by stacks located in the walls to the under-floor duct system. Special care was given in the duct design to minimize any resistance to air flow.

A more complete description of the construction and operating details of this money-saving, modern heating system is available upon request. Write for the "Kew Gardens Story" and learn how Janitrol can help you sell better home comfort at lower cost.



Extremely compact, this 105,000 Btu Janitrol Winter Air Conditioner requires a floor space of less than 22" x 22".

Janitrol

SURFACE COMBUSTION CORPORATION, TOLEDO 1, OHIO

BETH-CU-LOY SHEETS LAST LONGER

*they're
Copper Bearing*

You don't have to be a metallurgist to understand why Beth-Cu-Loy Sheets last 2 to 2½ times longer than ordinary sheets. Their extended life is due chiefly to the fact they are made from open-hearth steel containing 0.20 to 0.30 pct copper.

Tests conducted by the American Society for Testing Materials prove that steel sheets of this analysis have far higher resistance to atmospheric-corrosion than sheets of ordinary carbon steel.

For further protection against rust, Beth-Cu-Loy sheets are furnished with a bright coating of Prime Western zinc. This combination of a copper-bearing steel base with galvanized surfaces makes ideal sheet material for use in air ducts, conductor pipe, skylights, cornices and other jobs where long service is important.



BETHLEHEM STEEL COMPANY
BETHLEHEM, PA.

*On the Pacific Coast Bethlehem products are sold by
Bethlehem Pacific Coast Steel Corporation*



GALVANIZED STEEL SHEETS



QUIET...
as a
*Hushed
Whisper*



★ 1-Piece cast iron base and cast iron bearing support—extra strong, heavy, rigid, and vibration-free.

★ Statically and dynamically balanced blower wheel on 1" polished steel shaft — delivers large air volume at low operating speed, with extreme quietness.

★ Highest quality graphite bronze bearings — variable speed drive — rubber cushioned motor support — machined pulleys.

★ Full range of sizes—with all ratings certified. Furnished complete with enameled steel cabinet, or as blower assembly only.

PREMIER BLOWERS

These new PREMIER-made blowers are the finest we have ever offered, and they are priced for volume, sales, and profits. They are specially designed to add-on to previously installed gravity heating plants, thereby provid-

ing forced air circulation, air filtering, and lower fuel consumption.

Here are blowers that are tops in quality and vibration-free operation. We have them in the sizes you want, complete with motors, too.

PREMIER FURNACE COMPANY • Dowagiac, Mich.



STEEL FURNACES



CAST IRON FURNACES



WATER AIR CONDITIONERS



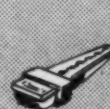
OIL BURNERS



BLOWERS



STORAGE



HUMIDIFIERS

14 FEATURES that make **GILLEN** the Outstanding **FLOOR FURNACE** **VALUE** on **TODAY'S MARKET!**

1 Sturdily built floor grille.

2 Non-corrosive outer casing. Strong construction and non-corrosive finish assures long life for this dependable furnace.

3 Floor level oil flow control rod. A key is furnished to extend through the floor grille to operate this rod, in manual operation. Oil flow is controlled by room thermostat on automatic models.

4 Oil shut off valve. Provided to break connection in the oil line from control valve when servicing the combustion chamber is required.

5 Floor level reset rod. Automatically trips off in case control should overflow.

6 Liner curved to parallel the outer surfaces of the two heating drums assures proper and adequate cold and warm air circulation.

7 Inner lining around the combustion chamber, gives added heating surface and full heat absorption. Assures a cool outside casing temperature.

8 Constant level oil control valve, including safety limit control and anti-flooding device, assures proper metering of the fuel to the burner.

9 Combustion chamber. Removable for servicing the burner and valve from floor level.

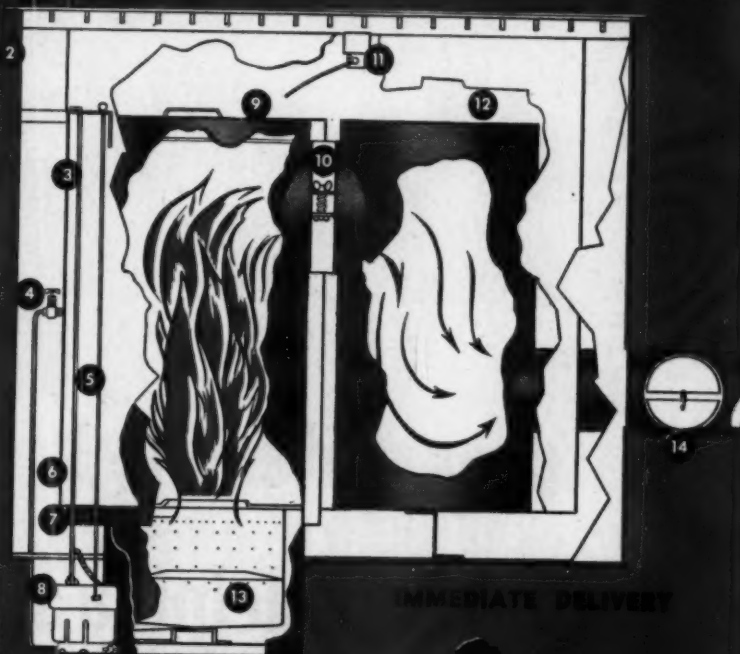
10 Removable band to seal the connection between the combustion chamber and the radiator. By loosening the band, the two heating drums can be separated.

11 Safety limit control bulb bracket.

12 Large radiator, for maximum heating surface. Specifically designed to obtain maximum heating efficiency from flow of hot gases.

13 Special burner that operates cleanly on low natural draft.

14 Automatic draft regulator, set at .06 inches.



Fully Approved by Underwriters' Laboratories!

No doubt about it . . . GILLEN leads in the small home heating field! Leads in design, construction, performance . . . meets maximum heating requirements of average 4-5 room homes . . . fully approved by Underwriters' Laboratories. Leads in economy . . . low first cost, low operating cost, low maintenance cost. Leads in sales and profits, too . . . the lowest priced most efficient floor furnace being manufactured today! Sold exclusively through authorized distributors under liberal franchise agreement. Write today for complete details.



Just remove floor grille, break oil connection, and loosen sealing band. Then lift up and the entire combustion chamber comes out for quick, convenient servicing!



J. L. GILLEN CO.

ROYAL OAK

MICHIGAN



One of the 45 quality homes built by Stephen Schifter, Inc. in Strafford Village on Philadelphia's "Main Line". These \$14,700 to \$26,500 homes are heated by Thatcher GA Comfortmasters — Gas Fired Winter Air Conditioners.



Partial view of above residence duct distribution system engineered and installed with Thatcher GA Comfortmaster by E. A. Danse-reau Co., Inc. — specialists in forced warm air heating.

Thatcher rates high on Philadelphia's "Main Line"

There's a Thatcher GA Comfortmaster being installed in every one of Stephen Schifter's 45 "Main Line" homes. A custom builder for 35 years — Mr. Schifter knows the importance of quality heating in terms of customer comfort. That's why we're mighty proud he chose Thatcher equipment to do this heating job.

You'll find there's extra profit awaiting you in Thatcher's line. Here's the

customer comfort, the service-free operation, the fuel economy that makes customers your best salesmen. That's why it pays to recommend yourself by recommending Thatcher — your warm friend since 1850.



GARWOOD, NEW JERSEY



Bonus* Built

THE AMAZING RESULT OF AN ENGINEERING PRINCIPLE THAT ASSURES LONGER TRUCK LIFE ... And ONLY Ford Trucks Have It!

Coming for 1948—a brand new line of
Ford Trucks . . . new all through . . .
and **Bonus Built**, too!

Soon you'll see the great new line of Ford Trucks—great not only because they are *new all through*, but because they are the amazing result of a time-proved truck building principle.

This principle is Ford **Bonus Built** construction. Here's what it means to you:

Every one of the new Ford Trucks for '48 is built with *extra strength* in every vital part. This extra strength provides **WORK RESERVES** that pay off in two important ways:

First, these **Bonus Built** **WORK RESERVES** give Ford Trucks a greater *range of use* by permitting them to handle loads beyond the normal

ORDINARY TRUCK



FORD BONUS BUILT TRUCK



Not ONE Capacity . . . but real RANGE when needed!

call of duty. Ford Trucks are not limited to doing one single, specific job!

Second, these same **WORK RESERVES** allow Ford Trucks to relax on the job . . . to do their jobs with less strain and less wear. Thus, Ford Trucks last *longer* because they work *easier*!



The load is carried **EASIER** by the stronger man!

Remember, every Ford Truck for '48 is **Bonus Built** for longer life, wider use. Keep in touch with your Ford Dealer . . . plan to see these new Ford **Bonus Built** Trucks for '48 as soon as announced. Don't settle for less—get the only truck that's **Bonus Built**! It's Ford!

***BONUS:** "Something given in addition to what is usual or strictly due."—Webster's Dictionary.

Listen to the Ford Theater over NBC stations Sunday afternoons, 5:00 to 6:00 p. m., E.S.T.

LIFE INSURANCE EXPERTS PROVE . . . FORD TRUCKS LAST UP TO 19.6% LONGER!

THE ANSWER TO "FUELISH" QUESTIONS

Above all the doubts that cloud the potential as well as presently available supplies of OIL, GAS, and COAL, one fact stands out clearly—

The Furnace Industry is obligated to provide the homes of America with adequate heating facilities regardless of temporary oil and gas shortages.

This can only be accomplished to the satisfaction of home owners by installing ALL-FUEL FURNACES. When you install Single-Fuel Furnaces in communities where the failure of gas or oil supplies, even though for a day, may cause health hazards and property damage, you take unnecessary risks. If home owners to whom you sell Single-Fuel Furnaces are left without a fuel supply, they will react unpleasantly, putting it mildly, when you tell them that they must buy another new furnace to keep warm.

It will pay you and your customers to play safe! Until "fuelish" questions can be completely answered, install only ALL-FUEL FURNACES. That is what Williamson Dealers are doing and their present profits and future good-will are thereby protected. If you are interested in this ALL-FUEL FURNACE Sales Plan, write today for "Fuel Facts".

THE WILLIAMSON HEATER COMPANY
CINCINNATI 9, OHIO

THERE IS A WEIRITE TIN MILL PRODUCT
TO MEET YOUR REQUIREMENTS

WEIRITE



HOT-DIP
TIN PLATE



ELECTROLYTIC
TIN PLATE



TIN MILL
BLACK PLATE



WEIRTON STEEL CO.

WEIRTON, W. VA. Sales Offices in Principal Cities

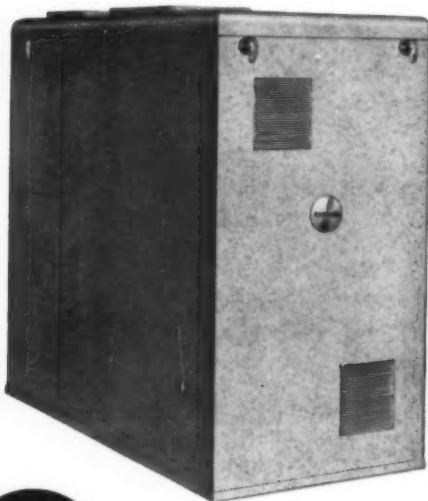
Division of NATIONAL STEEL CORPORATION Executive Offices, Pittsburgh, Pa.

**GAS?
COAL?
OIL?**

Depend upon **NIAGARA** **DEPENDABILITY**

In these days of fuel restrictions you must depend upon a heating line that meets *all* demands. That's Niagara—backed by over 55 years of experience in the manufacture of

residential heating equipment—a line that has earned a wide reputation for high-quality construction and economical operation—a line that builds profits and prestige for furnace dealers.



NIAGARA Oil-Fired **Winter Air Conditioners**

These new Niagara furnaces burn the lower-priced No. 3 fuel oil. Model 30-90 provides maximum capacity of 90,000 BTU at registers while the larger Model 30-135 delivers 135,000 BTU. Complete units include all modern automatic regulators, blower, air filters and pressure (gun type) burner, housed in a green Hammerloid enameled cabinet.

**SQUARE
or
ROUND**

Coal Furnaces **Gravity and Air Conditioning**

**CAST IRON
or
STEEL**

In Niagara coal-fired furnaces you will find a unit that meets any home heating requirement which calls for coal. Built with cast iron fire pot, feed section and radiator, these Niagaras are offered in several sizes with round casings. Two of the most popular sizes also furnished with square casings. Niagara furnaces of steel construction in a range of nine capacities are built with round casings—two popular models also available with square casings.

For winter air-conditioning installations, Niagara blowers are supplied as package units for installation with square cased coal furnaces.



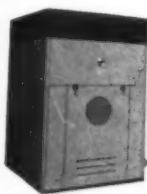
Gas-Fired GRAVITY FURNACES AND WINTER AIR CONDITIONERS



Series 20 Cast Iron
Winter Air
Conditioner



Series 10 Upright
Utility Model



Series 20 Cast Iron
Gravity



Series 10 Steel Gravity

Three distinct types of Niagara gas-fired furnaces provide a complete line. Niagara Series 20 Cast-Iron *Winter Air Conditioners* in five capacities meet the demand for deluxe gas equipment. The same sizes are also built for *gravity heating*. Two Niagara Series 10 steel furnaces for air conditioning and two for gravity are also available. In addition, Niagara Models 10-75VAC and 10-100VAC for utility room and apartment installations meet today's demand for gas-fired winter air conditioners in complete package units.

Write

for the complete story. Learn what's inside and back of Niagara furnaces—the furnaces that meet any requirement: gas, oil, coal.

NIAGARA FURNACE DIVISION

THE FOREST CITY FOUNDRIES COMPANY

2500 WEST 27TH ST., CLEVELAND 13, OHIO

*Sound Engineering
and Construction
make good motors*



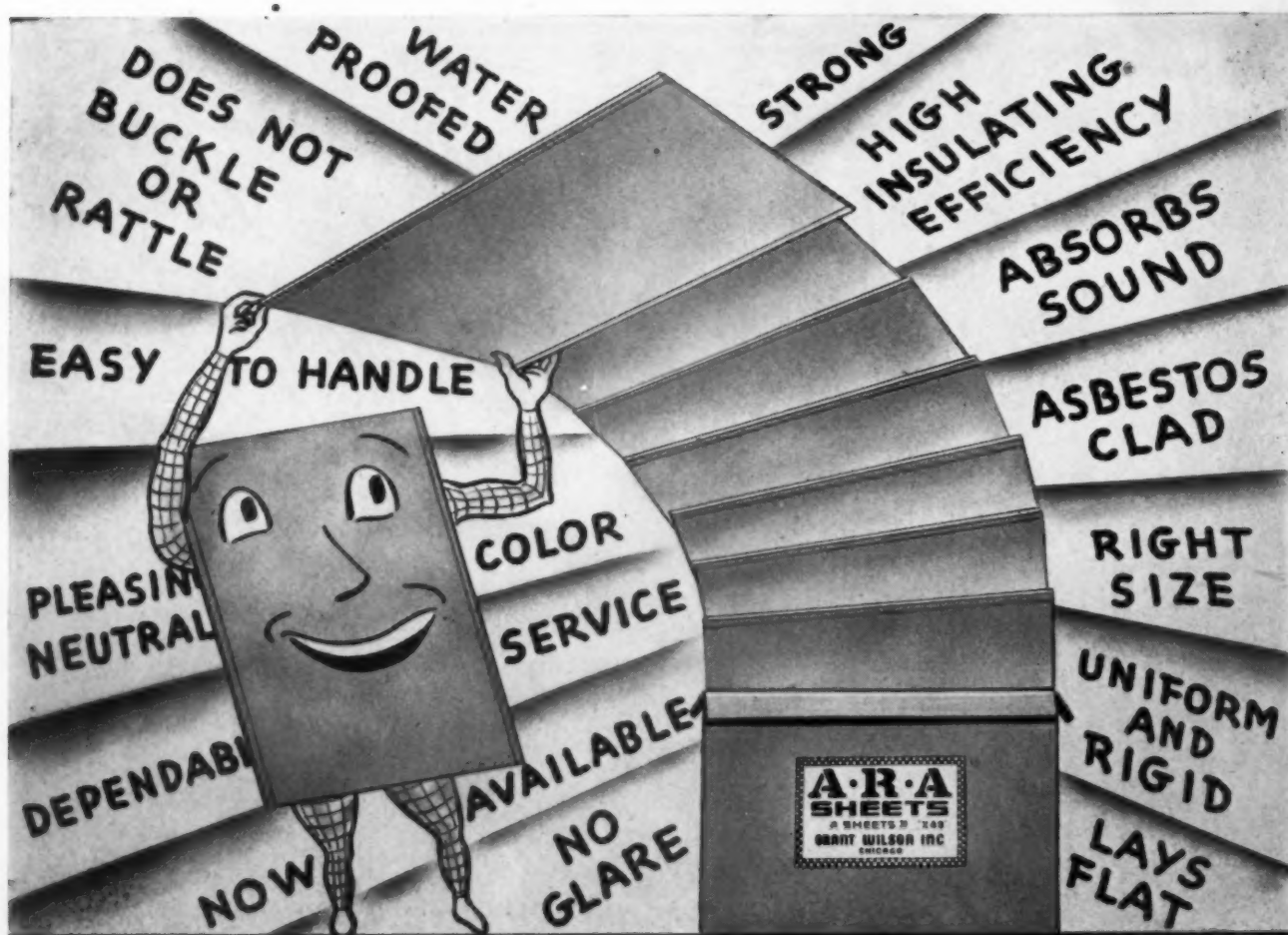
PACKARD SUNLIGHT MOTORS

**PACKARD
SUNLIGHT MOTORS**
for
compressors
washing machines
power-driven
bench tools
ironers
milk separators
milking machines
furnace blowers
stokers
oil burners
water pumps
ventilators
and many other
applications

Reserve starting torque. Large bronze journals. Heavy insulation. Careful manufacturing and inspection. These are some of the qualities that assure long life and satisfactory performance in Packard Sunlight motors.

Packard
REG. U.S. PAT. OFF.
TRADE MARK

Packard Electric Division, General Motors Corporation, Warren, Ohio



Best by TEST! for Cold Air Returns & Fabricated Ducts

During this extended sheet metal shortage A.R.A. Sheets rate **FIRST CHOICE** because of the many favorable characteristics of this one man sheet. Even sheet metal ducts, while preferred, would have to be insulated to equal the high insulating efficiency and sound deadening qualities of this nationally famous sheet. Its strength and solidity makes it a substantially **BETTER** duct than one made of lighter metals as a substitute.

Used for **COLD AIR RETURNS**, these uniform and

rigid Sheets are unexcelled as they are just the right size to cover the joist spaces perfectly. They absorb noise, repel moisture and insulate all at the same time (K. .45 B.T.U.). Furthermore they won't rust or look gaudy on the ceiling.

Buy A.R.A. Sheets today, they're available and will continue to be until regular sheet metal comes back to do the job—in the meantime rely on the tried and proven A.R.A. Sheets—millions of square feet are in use and have been in use for years.

CARTON CONTENTS
20 sheets 33" x 48" Per Carton

SHIPPING WEIGHT
Approximately 100 lbs. Per Carton

SHEET THICKNESS
Approximately 3/16" thick

GET GENUINE A-R-A SHEETS FROM YOUR JOBBER

GRANT WILSON, INC.
141 WEST JACKSON BLVD. AT LA SALLE ST. CHICAGO 4, ILL.
22nd Floor, Board of Trade Bldg. Phone: Wabash 82201

**WRITE TODAY FOR THE FREE 16-PAGE
ILLUSTRATED BOOKLET NO. 8912-A**



We've come a long way since then!

REMEMBER WAY BACK when pot-bellied customers snuggled up to pot-bellied stoves to warm up—one side at a time? They were highly regarded in those days—the stoves, we mean. But contrast those scuttle-stoked stomach scorchers with today's Richmond Winter Air Conditioners. There's real progress!

REAL PROGRESS IN HEATING. In the design and manufacture of winter air conditioners, Richmond has taken full advantage of

experience that dates back dozens of years. You can rely on every Richmond unit to deliver performance and economy.

GUARANTEED. All Richmond gas-fired furnaces and conditioners carry a full year's replacement guarantee and AGA approval. For details on any Richmond product, write your wholesaler. Or write Richmond Radiator Company, Dept. AA12, 19 East 47th Street, New York 17, N. Y., for the name and address of your nearest Richmond wholesaler.



**HEATOMAT
GAS BOILER**



**BROMLEY VITREOUS
CHINA LAVATORY**



**VERTICAL WINTER
AIR CONDITIONER**



BRESLIN RECESS BATH

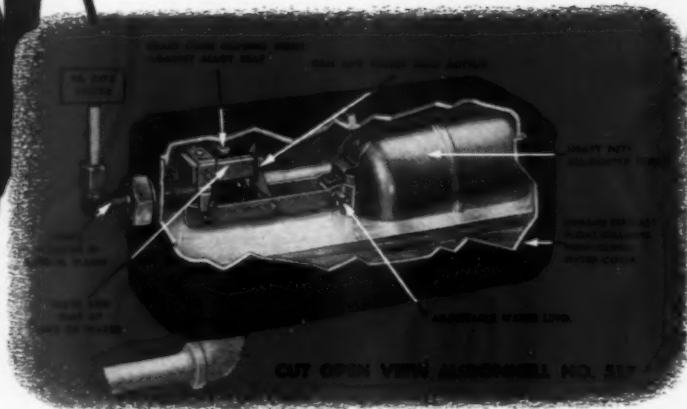
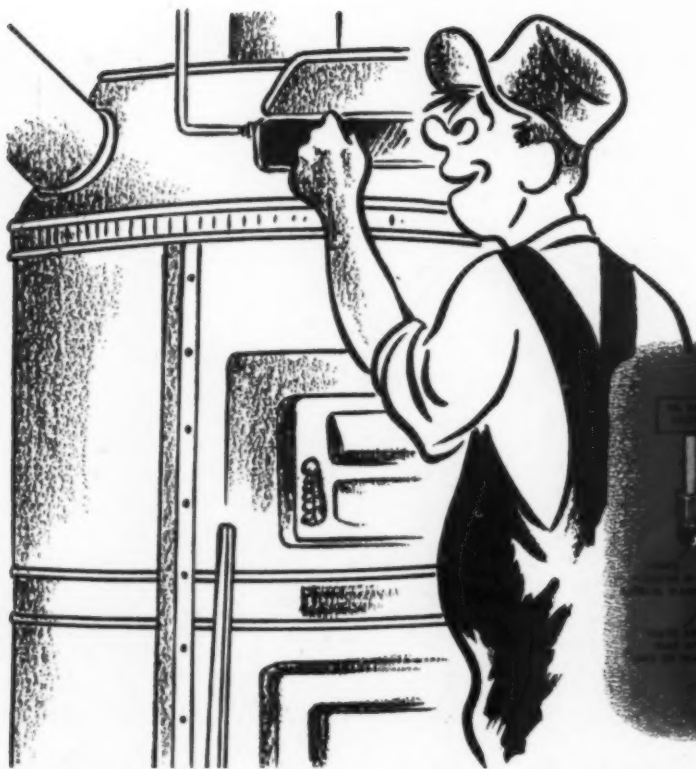


**SERVILLA ENAMELED
CAST IRON SINK**



**RICHMOND RADIATOR
COMPANY**
AFFILIATE OF REYNOLDS METALS COMPANY

Enameled Cast Iron Ware • Vitreous China • Perma-Gloss • Gas Boilers • Gas Winter Air Conditioners • Gas Gravity Furnaces • Radiators



Keep an eye peeled for replacements of humidifier valves ... **IT PAYS!**

A lot of furnace owners are going to find their houses as dry as deserts this winter unless their humidifier pans are equipped with a good, sure-fire float valve.

If you've inspected a few furnace pans, you know how true this is — how many of the old float valves are plugged up or otherwise inoperative. Too often the owner doesn't know about it . . . but he *should* — and pointing out the need for a good, dependable float valve will bring you a lot of good will and some worthwhile extra business.

In the McDonnell Snap Action Float Valve you have a valve that will really get on the job and keep going. It's as different from the old "dribbler" type of float valve as the modern automobile is different from the gas buggy. Just read the facts opposite and you'll know how true this is.

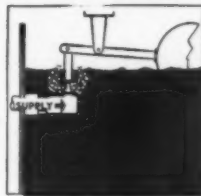
So outstanding is this valve in fact that many furnace manufacturers have made it optional equipment on their units. You can order it with most makes of furnaces, and when you do you assure your customer satisfactory humidifier water level control for years to come. Write for details and surprisingly moderate prices.

MCDONNELL & MILLER, INC.
1318 Wrigley Building, Chicago 11, Illinois

Doing One Thing Well
REG. U. S. PAT. OFF.

MCDONNELLE Snap Action FLOAT VALVE

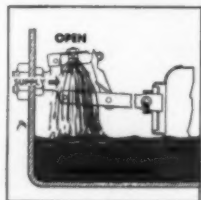
**It's the first engineered float valve
for humidifier pans**



★ NO DRIBBLING ACTION LIKE THIS!

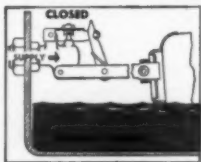
Valves that just dribble water as shown here, don't dribble very long before they clog up with lime and debris.

★ INSTEAD OF DRIBBLING, SNAP ACTION LIKE THIS!



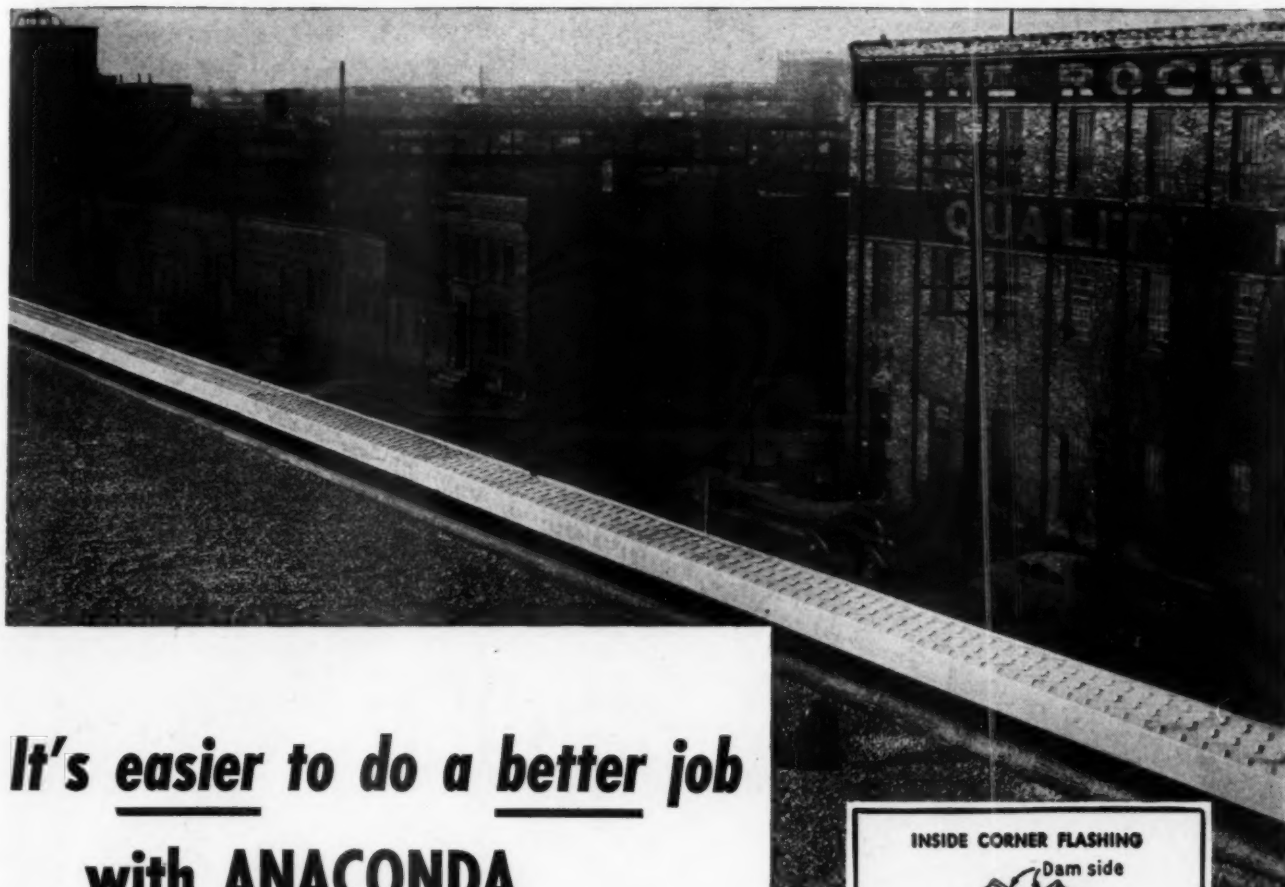
An ingenious cam and roller mechanism snaps the McDonnell Float Valve wide open when float falls 1/4 inch . . . opens up full stream that flushes out valve and keeps it operative.

★ TIGHT CLOSING TOO!



When water level is restored the valve snaps to a tight seal . . . bottle tight against water supply pressures up to 150 lbs. Note also that valve and seat are up out of the water.

And this is only the start of the story. Other features are the provision for adjusting water level; the heavy gauge pure copper float (not just copper plated); the monel strainer as an added protection of the valve. McDonnell Float Valves are available without float chamber (No. 417) or mounted in a sturdy die cast chamber with neat, well-fitted cover (No. 517). One of these is adaptable to any furnace, old or new.



It's easier to do a better job with ANACONDA Through-Wall Flashing

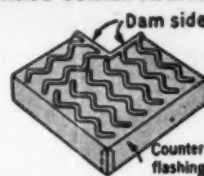
THIS UNUSUAL VIEW shows a long run of Anaconda Through-Wall Flashing . . . *the flashing that drains itself dry* . . . just as the sheet metal contractor left it and before the masons followed with coping.

Here you can plainly see the outer dam that will cause the seepage of water from the coping to drain toward the roof, and the corrugations that provide a strong bond with the mortar. These zig-zag ridges prevent lateral movement and insure water-tight joints when sections of the flashing are nested endwise. Here, too, you can see how the flat selvage makes a neat bend when formed as a counter flashing.

These die-stamped sections and corner units insure controlled drainage and make the work of the sheet metal man easier. Anaconda Copper insures long life. For detailed information, write for Publication C-3.

4753

INSIDE CORNER FLASHING

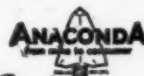


Standard inside corner flashing unit.
Dam on inside, drains out.

OUTSIDE CORNER FLASHING



Standard outside corner flashing unit.
Dam on outside, drains in.



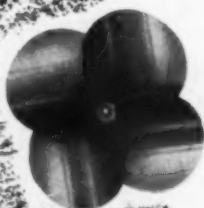
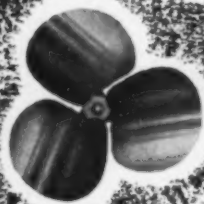
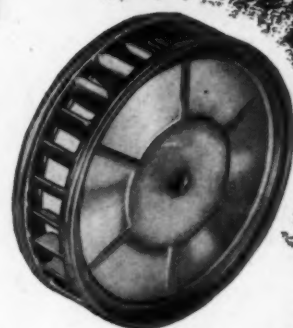
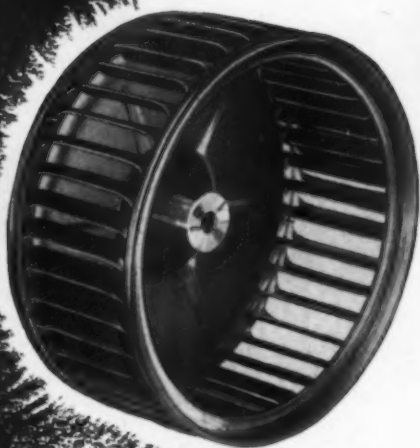
Anaconda
COPPER

THE AMERICAN BRASS COMPANY

General Offices: Waterbury 88, Connecticut
Subsidiary of Anaconda Copper Mining Company
In Canada: ANACONDA AMERICAN BRASS LTD.,
New Toronto, Ont.

Announcing

BLOWER WHEELS BY BURDEN



The new Burden Blower Wheels are light in weight, yet sturdily and rigidly constructed for the utmost efficiency in service. Made of aluminum or steel* with cadmium plated steel hubs, plain or anodized finish. Burden Blower Wheels are made with the same precision as the famous Burden Blades — electronically balanced statically and dynamically. Burden Wheels come with both single and double outlet and inlet. Made in a wide variety of diameters and widths.

**Quantities temporarily limited by present steel shortage.
Write Today for Illustrated Literature.*

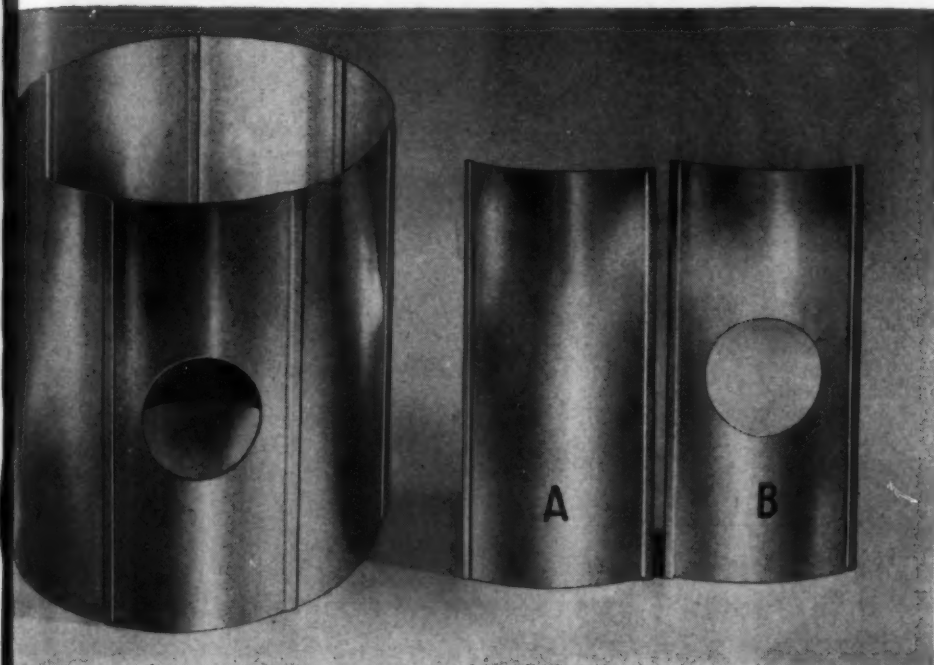
Burden COMPANY

1000 N. Orange Drive, Los Angeles 38, California

Canadian Representative: SILVER BROTHERS CO. 14½ King St. W. Hamilton, Ontario



NEW! REVOLUTIONARY!



Patent Applied For

**HEAT-RESISTANT
STAINLESS STEEL**

PANELOX

**COMBUSTION CHAMBER
FOR OIL BURNERS**

Gives You All These Advantages

**MORE SALES • BETTER NET PROFIT • EASIER INSTALLATIONS
LESS TIME REQUIRED PER JOB • SMALLER STOCKS
GREATER CUSTOMER SATISFACTION**

Gives Your Customers What They Want

Take a good look at the new Heat-Resistant Stainless Steel PANELOX Combustion Chamber. You're seeing the most amazing and efficient combustion chamber ever developed for domestic oil burners. It looks simple—and it is. Yet years of engineering experience—years of scientific experiment with designs and materials—went into its development. Check its features and advantages—see for yourself why it's in a class by itself. Then write, wire or phone for prices and further details.

PROVIDES INSTANTANEOUS COMBUSTION. The new, amazing PANELOX Combustion Chamber reflects heat instantly—heats up in seconds. No minutes-long warm-up period. That means complete, efficient combustion the minute the burner comes on. Customers like that.

ELIMINATES "BLOW-TORCH" STARTING ROAR—Cause of most oil burner noise complaints. Proper combustion, *right from the start*, is what does the trick. Customers like that.

ELIMINATES TURBULENCE NOISES during burner operation. No dead air spaces, no rough surfaces, to set up noisy flame turbulence. Customers like that, too.

PAYS FOR ITSELF in fuel savings. Instant combustion means less heat up the chimney—more heat doing a heating job. More BTUs from every gallon—fewer gallons required. Customers like that.

ELIMINATES SMOKE, SOOT AND OILY FILM caused by inefficient combustion. Proper burning means clean burning. And customers like that.

PROVIDES BETTER ROOM TEMPERATURE CONTROL—by eliminating override. Burner starts heating as soon as it comes on. No wide variations in room temperature due to override. Customers like that.

*Inquiries invited from Manufacturers' Agents.
Several good territories still open.*

STEFECO STEEL COMPANY

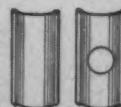
HEATING EQUIPMENT DIVISION • MICHIGAN CITY, INDIANA

Check These Outstanding PANELOX

Features



HEAT-RESISTANT STAINLESS STEEL. Highest in chromium content, it is exceptionally heat- and corrosion-resistant. Not affected by sulphur-bearing oil. Withstands temperatures up to 2150°F. Thoroughly tested and proved under actual operating conditions.



ONLY TWO TYPES OF INTERLOCKING PANELS. With the two types of panels shown, you can speedily form any size or shape chamber required. "A" panels are standard. "B" panels have openings to accommodate 4-in., 5-in., or 6-in. burner guns. Panels are 6 3/4 in. by 14 1/2 in.



INTERLOCKING SEAMS PREVENT WARPING. Note how the panels interlock at the seams—an exclusive feature with the PANELOX. Easily joined by sliding one interlocking edge over another. Those interlocking seams add great rigidity and structural strength. And see that clean interior? No dead spaces there to cause operating noise.



LIGHT IN WEIGHT—EASY TO HANDLE—NO BREAKAGE. Panels required for the average combustion chamber weigh only about 8 pounds. And the panels nest together so they're easy to handle. No breakage in shipment, handling or installation.



NO BACKFILL INSULATION! NO CEMENTING! NO TOOLS! Installation couldn't be easier. No tools required in assembling and installing. No backfill insulation or refractories needed. No cementing of any kind. Speeds up every job—cuts labor cost way down.



LOW INVENTORY—LOW FREIGHT COST. No need to stock several sizes. The two types of panels make any size or shape combustion chamber. And the light weight means exceptionally low shipping cost.

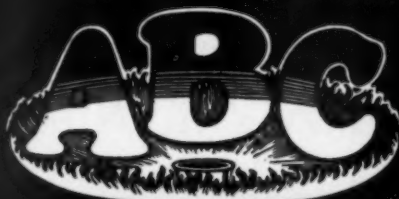
7 big new advantages for every

FURNACE MANUFACTURER



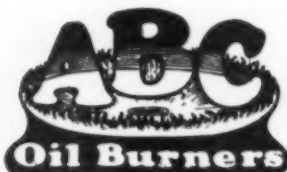
- Light Weight
- Easier to Service
- Smaller Size
- Attractive Appearance
- Easier to Install
- Saves Steel
- Underwriters' Approved

new




MODEL 51

The oil burner you've been waiting for is almost here! Only 9 9/16" from front of Mounting Plate to rear of burner—perfectly adaptable to shorter vestibules. Unusual transformer mounting—just swing it aside for easy withdrawal of drawer assembly and breaking of connection between transformer and drawer assembly. **TEN SECOND NOZZLE REMOVAL.** Other features include exclusive ABC Oilairator, Peri-spin Turbulator and Governoil Nozzle. Will be available in three air delivery combinations from 0.6 GPH to 2.5 GPH. Find out how the Model 51 can help solve your production problems. Write for complete details.

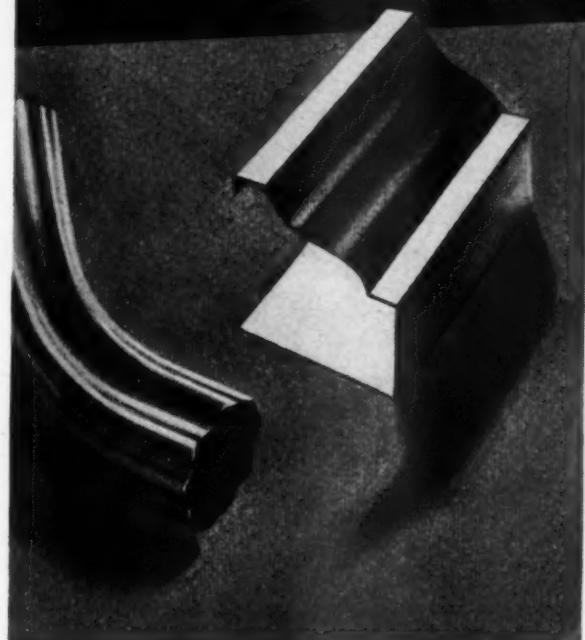


AUTOMATIC BURNER CORPORATION

1823 CARROLL AVENUE • CHICAGO 12, ILLINOIS



You get
MORE PROFIT PER JOB
MORE JOBS PER YEAR
by selling **STAINLESS**
roof drainage



ADD UP the facts and you'll see how you can profit those two ways on every ARMCO Stainless Steel roof drainage system you sell.

1. ARMCO Stainless is exceptionally strong and withstands sagging under heavy loads of ice and snow. It also resists cracking caused by extreme temperature changes and, being rustless, won't stain adjacent surfaces.
2. Workability of 28-gage Type 301 ARMCO Stainless is comparable with 26-gage galvanized steel. You can handle it on standard equipment.
3. Being solid, rustless metal, ARMCO Stainless will last the life of the house. You can assure your customers of extra-durable, trouble-free roof drainage.
4. As for cost, you can tell them that ARMCO Stainless, with all its advantages, actually costs less than any other top-quality material ordinarily used for this purpose.

Write today for your free copy of "ARMCO Stainless Steel for Gutters, Conductor Pipe and Accessories." The American Rolling Mill Company, 430 Curtis Street, Middletown, O. Export: The Armco International Corporation.

★ ★ ★

TURN IN YOUR SCRAP NOW—

HELP MAKE MORE STEEL

Scrap piles in most steel mills are critically low. Unless this shortage is relieved, everybody must wait longer for steel. Collect all the steel scrap you can find and speed it through regular channels to the mills. Remember — more scrap means more steel, sooner.



THE AMERICAN ROLLING MILL COMPANY

• SPECIAL-PURPOSE SHEET STEELS

• STAINLESS STEEL SHEETS, STRIP, BARS AND WIRE



field

"Always the Pace Setter"

DEVELOPS The new, sensational, proved-by-test combination
Automatic Barometric Draft Control and Check Damper

BAROCHEK

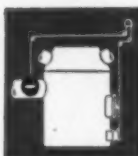
Developed for economy and safety, BAROCHEK reduces the cost of supplying and installing both a barometric control and a check damper. BAROCHEK prevents the usual waste of heat out of the stack, provides proper combustion conditions, and limits the drafts which a chimney develops. BAROCHEK provides real savings to the furnace manufacturer, the installer, and the user.

BAROCHEK provides safety through proper combustion control in hand-fired coal burning furnaces and boilers. With soft coal especially, uncontrolled drafts through a wide open ash pit and flue pipe will make the furnace and flue pipe reach dangerously high temperatures and become a definite fire hazard.

BAROCHEK combines the features of the famous 8-9" size Field Draft Control and a check damper in one.

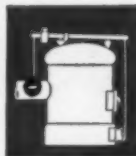
The "Best for the Finest"

HAND-FIRED FURNACES



On warm air furnaces, whether controlled by damper motor or by hand, the chain ordinarily attached to a check damper is connected to the lever on the new Field BAROCHEK Control. The check damper is eliminated, or sealed if already installed.

HAND-FIRED BOILERS



On boilers with diaphragm damper control, one end of control chain is attached to the lever on the Field BAROCHEK Control, while the other end of the chain is fastened to the counter balanced steam pressure bar.

WRITE FOR COMPLETE INFORMATION AND DESCRIPTIVE LITERATURE

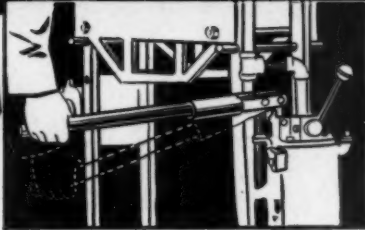
FIELD CONTROL DIVISION

H. D. CONKEY & COMPANY • MENDOTA, ILLINOIS

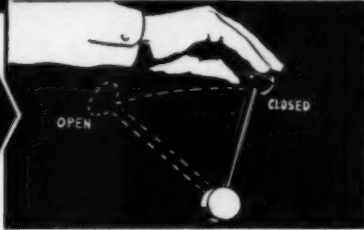
Designed and developed as the result of recommendations by leading heating and research engineers.



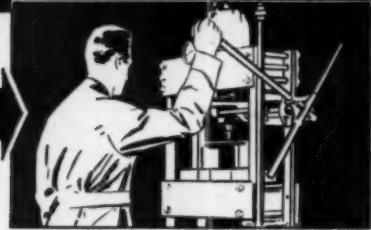
These **KRW** Hydraulic Arbor Press Features...



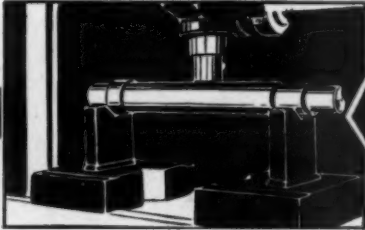
Fast Action, cylinder is filled as ram travels to work. You get tons of pressure with first pump stroke.



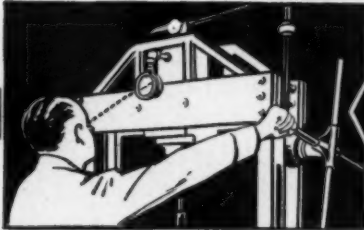
Finger Tip Control opens and closes valve in a jiffy. No gripping effort assures easier, faster operation.



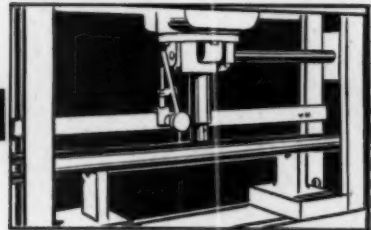
KRW Built-in Mechanical Press permits up to 3 tons pressure for straightening small diameter work.



One Piece, All Steel V-Blocks have machined surfaces for greater accuracy; usable upright or inverted.

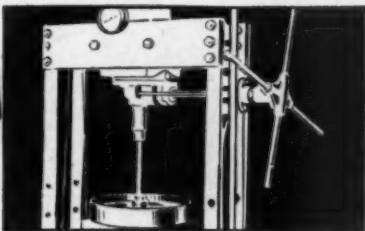


Highly Visible Pressure Gauges are mounted where they can be quickly checked. Read in tons and pounds.

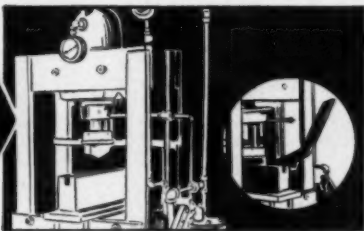


Micrometer Dial Attachment permits great accuracy in checking work without removing from V-block.

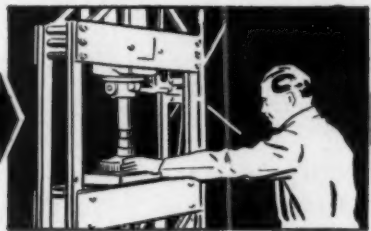
Reduce Costs ON THESE AND OTHER DAILY Production Jobs...



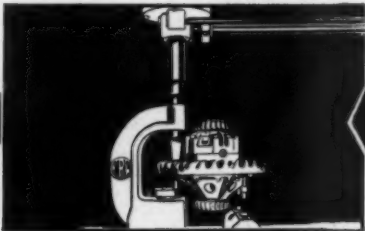
Broaching a key way in a flywheel. 7½ inch ram travel makes many broaching jobs practical on KRW Presses.



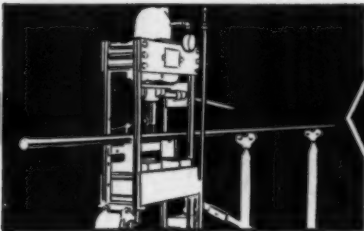
Bending in production lots with simple, inexpensive dies is easily done on low-cost KRW Hand-operated Presses.



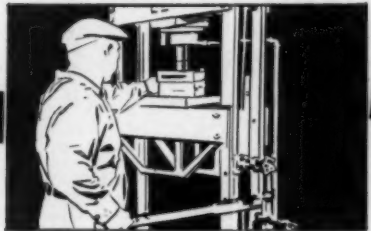
Pressing of all types is efficiently handled. Adjustable bed makes pressing on long shafts a very simple operation.



Riveting with KRW Riveting Attachment is simplicity itself. Many KRW Presses are used for this type work.



Straightening, especially on long work, is easy on a KRW Press because of its special open-end construction.



Blanking is easy with simple die set for short-run operations. Releases regular equipment for quantity production.

Write for the
**NEW
KRW**
Catalog.....



K. R. WILSON, 215-217 Main St., Buffalo 3, N. Y.

Please mail me a copy of your
Hydraulic Arbor Press Catalog

Name

Address

City Zone State

K·R·WILSON

215 MAIN STREET, BUFFALO 3, N. Y.

Comfort is profitable

Clean, Reliable
"Shovel Free" Heat
is Becoming More
and More Popular



Increasing millions of people do not like to "shovel their heat." As the average age of the population rises—as people realize the advantages of oil heat, more and more have less inclination toward the heavy work of shoveling.

They cheerfully pay for the comfort of clean, reliable "shovel free" heat—make it profitable to sell. Comfort will be profitable for you if you sell "Detroit" Float Valve equipped space heaters, water heaters, furnaces and ranges.

"Detroit" Float Valves provide the best, most reliable control for vaporizing oil burners. Easily cleaned, maintenance is never a problem. Full temperature compensation assures even flow of fuel, regardless of oil temperature.

2864

"DETROIT" Float Valves
Guardians of the Home Fires



"Detroit" CRC-239 Float Valves are available in several models to fit all needs.

For Space Heaters and Ranges: CRC-239, Manual; Non-Metering, Single Metering and Dual Metering

For Furnaces: CRC-239-WA & WB, Manual; with automatic limit control

CRC-239-FF, Thermostat controlled; with 2-speed draft fan control

CRC-239-FH, Thermostat controlled; with draft fan control for high fire only

CRC-239-FN, Thermostat controlled; without draft fan control

For Water Heaters: CRC-239-W, Automatic operation to maintain water temperature

DETROIT LUBRICATOR COMPANY General Offices: 5900 TRUMBULL AVENUE
DETROIT 8, MICHIGAN



Division of **AMERICAN RADIATOR & Standard Sanitary CORPORATION**
Canadian Representatives—RAILWAY AND ENGINEERING SPECIALTIES LIMITED, MONTREAL, TORONTO, WINNIPEG

"Detroit" Heating and Refrigeration Controls • Engine Safety Controls • Float Valves and Oil Burner Accessories
"Detroit" Expansion Valves and Refrigeration Accessories • Stationary and Locomotive Lubricators

In addition to MORE-PROFITS...MOR-SUN gives you

a planned

MERCHANDISING PROGRAM!



The warm air-conditioning MOR-SUN pressed steel furnace gives you more than beauty and BTU'S...

MOR-SUN gives you a complete merchandising program for MORE-PROFITS...planned to increase your present business and insure your profitable future... The MOR-SUN program is a down-to-earth manufacturer-dealer relationship based on actual field conditions... complete dealer training and sales aids, sales bulletins, consumer literature, national advertising aimed to architects and builders and consumers...

You... and your customers... get MORE from MOR-SUN!

"The Sun Never Sets with MOR-SUN!"

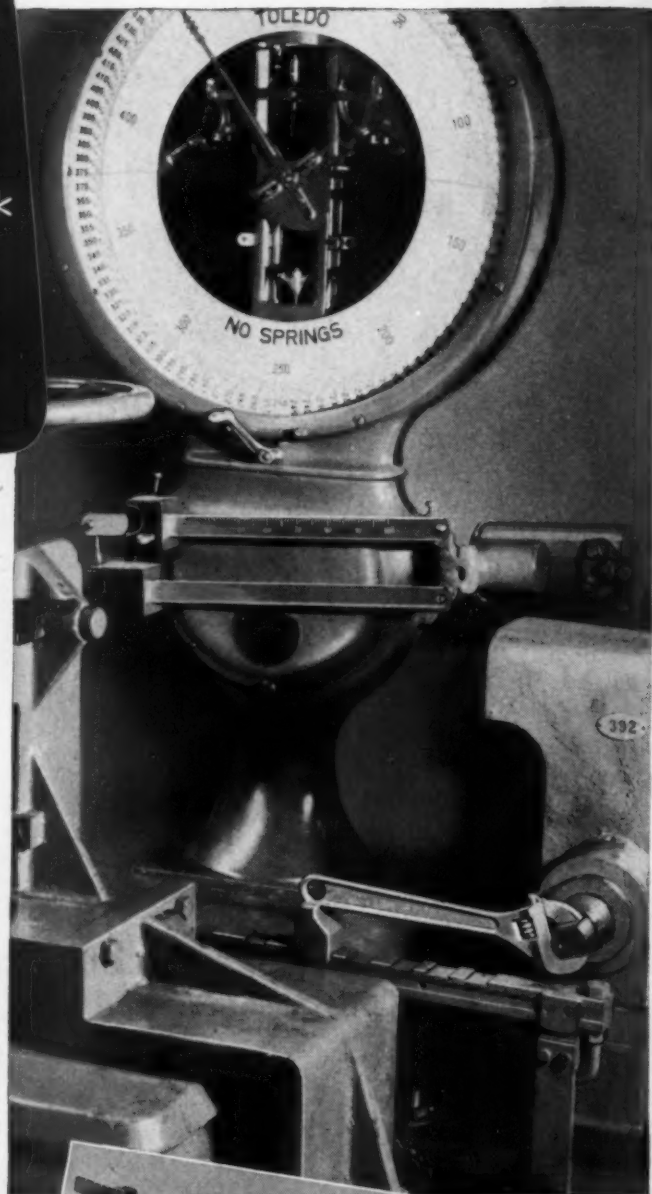
MORRISON STEEL PRODUCTS, Inc., BUFFALO 7, N. Y.

Tests Prove
STRENGTH and DURABILITY
of
CRESCENT*
TOOLS

There's much more strength in Crescent Tools than is actually needed for their efficient and enduring performance. For instance, no human being could possibly apply the strain to which the wrench in the photograph is being subjected. Yet, constant testing proves the ability of these wrenches to withstand great strains without failure.

This is but one of many tests which insure that all tools shipped out of the Crescent plant have more than ample ability to perform their intended tasks.

Whether you buy Crescent Tools for your own use or for resale—remember this fact: Every one is carefully made from selected raw materials, machined by precision methods, accurately hardened and tempered and nicely finished, ready to take its place in the work of the world and do its job well.



This shows how Crest-oloy Pliers are individually tested for cutting ability before being boxed for shipment.



Crescent Screwdrivers are heat treated full length. This test determines their efficiency in that respect.

***CRESCENT TOOLS**
Give Wings to Work

CRESCENT TOOL COMPANY, Jamestown, N. Y.

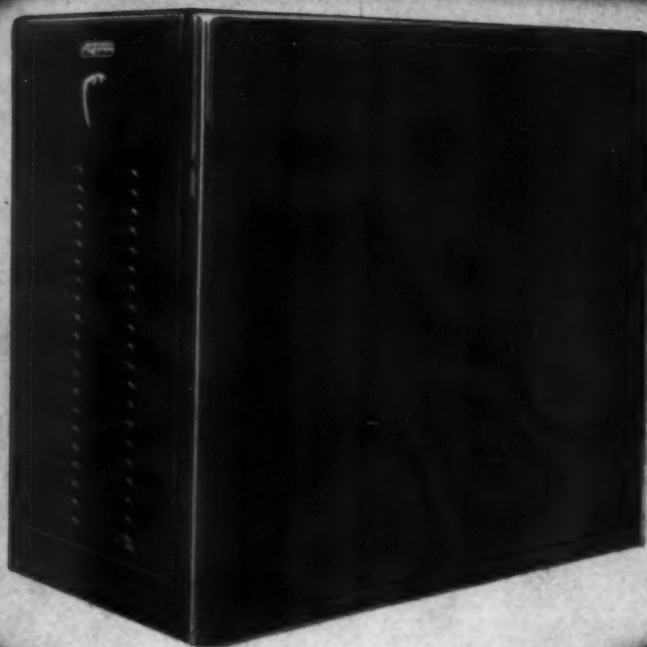
*"CRESCENT" is our trade-mark registered in the United States and foreign countries for wrenches and other tools. "Crescent" tools are made only by Crescent Tool Company of Jamestown, N. Y., and are sold by leading distributors everywhere.

KO-Z-AIRE CONDITIONING UNITS

*Easy to Sell -
Easy to Install*

KO-Z-AIRE Conditioning Units have plenty of sales appeal in appearance, important features and sound engineering principles. They're easily

installed, too—and contractor-dealers need little urging to concentrate on KO-Z-AIRE completely automatic (oil or gas fired) Conditioning Units.



✓ Check These Features

Automatic firing with either gas or oil provides clean, even, healthful heat. 65,000 to 350,000 Btu output.

Extra long flue travel provides extra large heating surface—more efficient fuel combustion.

Oversize filters remove dust, dirt and pollen from the air with greater efficiency.

Extra large blower and famous make motors provide quiet circulation of warm (or cool) air.

Larger radiating surface provides quicker pick-up and transfer of heat. Special baffles retard heat from passing flue gasses.

Sturdy steel construction throughout.

Wire Today For Details

There are still excellent territories available in all parts of the country for alert jobbers to profit from the KO-Z-AIRE line of Conditioning Units. Write, Phone or Wire for complete details and prices.

KO-Z-AIRE

Nationally Distributed By

JONES & BROWN, INC.

439 SIXTH AVENUE, PITTSBURGH 19, PA.

New UNAPAC with New A-P AUTO-AIR Control Unit

IMPROVES DESIGN BEAUTY . . .
SIMPLIFIES INSTALLATION . . .
ADDS GREATER CONTROL ACCURACY

Controls EVERY Function of Today's Vaporizing Oil Burning Furnaces

● Here is a combination that really modernizes control operations on Vaporizing Oil Burning Furnaces. Streamlined, modern in design, compact, easy to install at less cost, this A-P Control Unit greatly improves both the appearance and control accuracy of every appliance.

The new A-P AUTO-AIR shutter unit, for mounting on standard booster fan, is one of today's most important advances in vaporizing burner oil heating. It "meters" air to match the oil input for effective booster draft control, helping avoid the problem of varying natural draft conditions.

The UNAPAC, in addition to providing for "modulating" booster draft control through the AUTO-AIR Unit, also includes provision for Thermostatic Temperature Control, "Magic Pilot" Oil Control, Limit Control, Blower Control, and Summer Air Circulation. It effectively controls every function of the modern Vaporizing Oil Burning Furnace. Easier to install — at factory or in the field (only three mounting holes) — it saves labor and service costs, improves the appearance of the appliance, and assures greater convenience and satisfaction in use.

● IMPROVE the appearance, heating convenience and dependability of your new Vaporizing Oil Burning Appliances—with new UNAPAC and A-P AUTO-AIR Control! Write for complete details and specifications TODAY!

AUTOMATIC PRODUCTS COMPANY

2452 North Thirty-Second Street, Milwaukee 10, Wisconsin

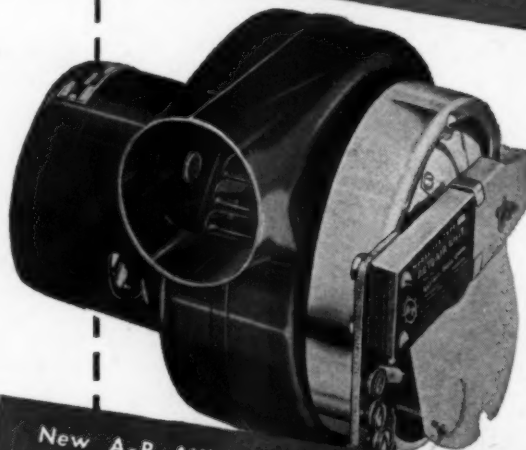


DEPENDABLE
Oil Controls

DESIGNED TO ELIMINATE SERVICING

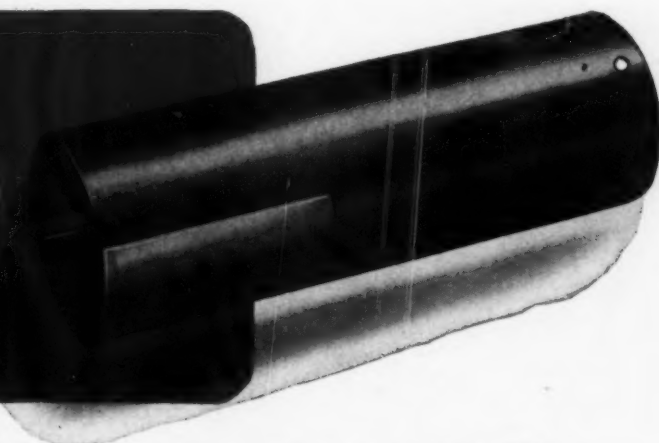


New UNAPAC showing streamlined design, and also with cover removed to show Oil Safety Control, Electric "Auto-Heat" Top and wiring for complete furnace control including AUTO-AIR Draft Control.



New A-P AUTO-AIR Unit, mounted on standard booster fan, regulates air input for all burner positions.

CASH REGISTER FOR 1948



This is the DUAL-OXENIZER . . . cash register for 1948. Thousands of worn-out, inefficient oil burners need replacing—today. Homeowners—countrywide—are calling out for an oil burner that will save oil. The new Master Kraft oil burner with its amazing new Dual-Oxenizer has proved beyond a doubt that it *actually saves* up to one gallon out of five! This startling news, Mr. Dealer, will sell burners and sell them fast! The market is ripe—eager—for the new Master Kraft . . . the only first postwar burner on the market.



WHAT IS THIS NEW INVENTION?

The direct result of our war research, building compact aircraft heaters for U. S. This new simple, yet effective device combines a double charge of oxygen with oil—controls the volume and action of the oxygen to give high CO₂—lower stack temperature—higher evaporation—higher overall efficiency. Burns either catalytic oils or regular No. 2 oil with the same high efficiency. This *brand new* line will speed the tempo of your sales—both in replacement and new installations. Master Kraft national advertising is telling a timely story to thousands of prospective customers in your area. Will you have this fast-selling line of oil heating equipment when inquiries pour in?

Let us show you the amazing test figures of this new oil burner—see for yourself how Master Kraft can keep your cash register ringing in '48. Mail the coupon below . . . TODAY.

**Master
Kraft**

**HARVEY-
WHIPPLE
INC.
SPRINGFIELD, MASS.**

HARVEY-WHIPPLE, INC.
Dept. A. A. 12
Springfield, Mass.

Gentlemen:


Please send me information about a Master Kraft franchise.

Name

Street

City

State



1948

A year of promise

WITH the arrival of another Holiday Season, we find ourselves looking forward to 1948 as—A Year of Promise. This good feeling comes from the knowledge that the steel industry is already engaged in the greatest expansion program in its history.

The benefits of increased supply from added producing facilities will naturally be gradual, but we go into 1948 fully expecting to do a better job of taking care of your steel requirements.

We have already improved our facilities for service by erecting new modern warehouses in Cleveland and St. Louis. We have also opened a new warehouse in Los Angeles which will go a long way toward supplying the needs of steel users on the West Coast. And we expect to make other improvements and additions to our service facilities during 1948, so that our name will continue to be a "Symbol of Service" to steel users.

Meanwhile, we extend to you our cordial best wishes for a happy Holiday Season and a successful, prosperous New Year.

**UNITED STATES STEEL
SUPPLY COMPANY**

BALTIMORE • BOSTON • CHICAGO • CLEVELAND
LOS ANGELES • MILWAUKEE • NEWARK
PITTSBURGH • ST. LOUIS • TWIN CITY (St. Paul)



UNITED STATES STEEL



Job After Job Calls for Heating *and* Cooling... GET THE CONTRACT FOR *Both...* WITH TRANE PRODUCTS

Job after job now calls for both heating and cooling. Since the functions are so closely allied, often being accomplished with much of the same equipment, heating and air conditioning *must* be considered together.

Architects, engineers, and owners prefer a minimum of contracts and responsibilities — so the contractor who can bid on the whole job has a much greater chance of getting it. The contractor who cannot bid on the whole job may likely lose it to one who can.

Heating and air conditioning are so closely related, from figuring the job through installing it, that it is only logical for the contractor to grow with the industry by combining heating and air conditioning. In this way, the contractor has peak business the year around, and is assured of a steadily increasing market

in remodeling and modernization work, as well as in new construction. Just as the contractor needs both heating and air conditioning to make his service complete, the heating and air conditioning industries need additional contractors so that they can expand to meet the enormous demand.

Trane is the ideal source of supply for the independent contractor who combines heating and air conditioning. The complete Trane line includes every necessary product for entire heating and air conditioning systems — giving the contractor the undivided responsibility of *one* manufacturer. Trane field engineers in 85 field offices are constantly available for help and advice in any phase of heating and air conditioning.

TRANE

Manufacturing Engineers of Equipment for
HEATING AND AIR CONDITIONING

THE TRANE COMPANY, LA CROSSE, WISCONSIN • Also TRANE COMPANY OF CANADA, LTD., TORONTO, ONTARIO



The Trail

to Sales

is assured with the

HESS CLIMATE MASTER

OIL FIRED WINTER AIR CONDITIONER

Designed to burn oil • Convertible to coal or gas

Protect your customers in case of an emergency requiring change-over to solid fuel. The grate, ash door and brick lining can be installed within a short time, thus preventing the scrapping of the entire unit. Gas unit with high operating efficiency can be installed at any time.

DEALERS

Write today for details on the HESS line.

ON THE SQUARE
RADIANT HEATING

HESS

Since 1873

WARMING & VENTILATING CO.

1211 So. Western Ave., Chicago 8, Ill.



MORRISON



BLOWER WHEELS

Standard equipment for manufacturers building blower assemblies in heating, ventilating and air conditioning.

THIS month Morrison Products, Inc. celebrates its 25th Anniversary—25 years of service to manufacturers of original equipment.

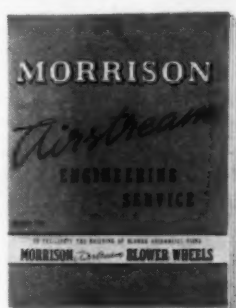
Available are:

1. Blower wheels in standard diameters from 10" up to 16". Wheels—Double Width—Double Inlet—are 3-piece welded con-

struction—smooth running, light weight and high efficiency.

2. Housing squares and scroll sides for low cost assemblies in your own plant.

3. Complete Engineering Service, including templates, shop drawings, graphs, charts, tables and data, consultant help, cost analysis, recommended sources for various component parts.



★ **Ask for
Booklets
Illustrated**

• Morrison also has a completely equipped contract manufacturing division for the manufacture of anything from simple stampings to a finished sheet metal assembly.

MORRISON PRODUCTS, INC. • 168th and WATERLOO ROAD • CLEVELAND 10, OHIO

Automatic Controls...

Buy the Package

No other controls offer all these outstanding advantages



T-30 GAS HEATING SET

This set includes silent K-38 two-wire gas valve, T-70 two-wire Metrotherm and 115-24 volt transformer. Ideally adaptable to gas fired boilers, wall and floor furnaces, conversion burners and warm air furnaces.



T-40 GAS HEATING SET

Package set includes two-stage Thermostat, dual solenoid valve and Transformer. Provides fully automatic, hi-low firing, maintaining ideal temperature control and lowered fuel cost.



T-90 STANDARD THERMOMETER SET

Set combines improved B-60 gas valve, flush mounting Thermometer Thermostat and Pilot Generator. Positive remote temperature control for gas fired furnaces.



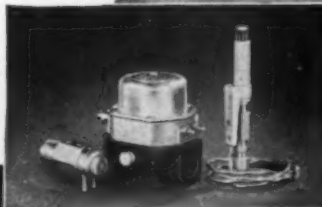
T-23 OIL HEATING SET

For remote thermostatic control of oil heating furnaces, circulating heaters, conversion burners, etc. Includes solenoid oil valve with by-pass adjustment for minimum flow regulation or pilot, two-wire metrotherm and transformer.



BX-230 STANDARD THERMOSTAT SET

BX-230 includes B-60-68 diaphragm gas valve, PG-6 Pilot Generator, and T-80-4 Thermometer type Thermostat with night cut-off. For wall and floor furnaces, circulators, etc.



BX-250 WATER HEATER SET

New all-gas control set combination combines L-61 Tank Thermostat, B-60-68 gas valve and PG-6 Pilot Generator. For hot water heating applications.



T-95 TIMER SET

Includes improved B-60 gas valve, Pilot Generator and Timer Thermostat. Pilot Generator provides operating current, main burner ignition and safety control.

For complete specifications covering the **GENERAL CONTROLS** broad line of *Automatic Pressure, Temperature and Flow Controls*, see the new 1946 Catalog 52C. For Gas Heating Controls request Service and Instruction Manuals.

GENERAL CONTROLS presents seven of their convenient packaged sets for compact inventory and simple installation. Here are precision built, field proved package sets most frequently desired by heating contractors and engineers. Buyers can select complete sets in compact cartons; each set includes essential units required. Get improved performance at lower costs through **ENGINEERED** adaptability.

GENERAL



CONTROLS

37-1

Manufacturers of Automatic, Pressure, Temperature & Flow Controls

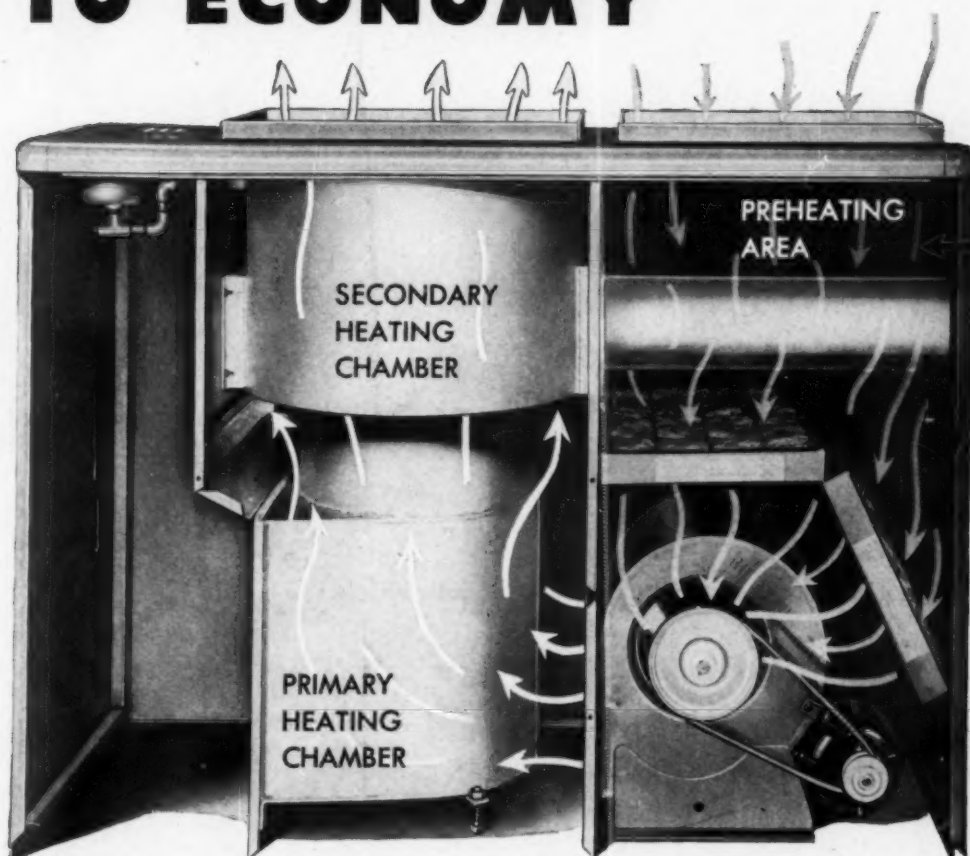
FACTORY BRANCHES: PHILADELPHIA • ATLANTA • BOSTON • CHICAGO • DALLAS
KANSAS CITY • NEW YORK • DENVER • DETROIT • CLEVELAND • PITTSBURGH
LONDON • SEATTLE • SAN FRANCISCO • DISTRIBUTORS IN PRINCIPAL CITIES

Follow the arrows

TO ECONOMY

The Fitzgibbons Directaire works ideally with either the oil or gas burner of your choice. The attractive jacket completely encloses most burners and all controls. Jacket panels are quickly removable for easy servicing.

The Directaire is built entirely of steel, electrically welded into a gas-tight unit. The jacket assembles easily and quickly. And the oil or gas burner operates at highest efficiency, providing lowest possible operating costs.



LOW-COST ALL THE WAY The principle of "Contra-Flo" Circulation as applied in the Fitzgibbons Directaire, takes every possible B.t.u. out of the fuel and applies it to heating the circulated air. This is the basis for Directaire operating economy. The incoming air first enters the preheating area . . . Then it is drawn through the filter, by the large, slow-speed quiet blower, and into the primary heating chamber . . . Then up into and through the secondary heating chamber, where it also receives humidification.

Six sizes — 65,000 to 200,000 B.t.u./hr. Full data in the bulletin on request.



Reg. U.S. Pat. Off.

Fitzgibbons Boiler Company, Inc.

101 PARK AVENUE, NEW YORK 17, N. Y.

Manufactured at: OSWEGO, N. Y.

Sales Branches in Principal Cities

FITZGIBBONS DIRECTAIRE
The warm air conditioner that meets all conditions



He changed "Watertown" to "Timken Town"

ALL AUTOMATIC oil burners installed in Jefferson County, N. Y., have to pass a state electric inspection. So says the law that went into effect in February, 1947.

And here's what Jefferson County records say: *Timken Dealer C. A. Burkhard, Watertown, N. Y., has installed more Timken Silent Automatic Oil Burners since that date than the total of all other makes combined.*

And thereby hangs a tale.

Burkhard took the Timken franchise in 1936—did a steadily increasing business in the next few years—sold 41 Timkens in 1941, last full year of prewar production.

But here's his record since that time: 1946—126 Timkens installed; first four months of 1947—74 Timkens installed!

"I wish I could say it was all due to good selling on my part," writes Timkeneer Burkhard, "but it wasn't. *Satisfied users and public acceptance of Timken have been principally responsible for making Watertown another Timken Town.*"

That's the way it goes, wherever a Timken is installed. Neighbor follows neighbor—neighborhood follows neighborhood—until entire communities know the comfort, convenience and economy of Timken Oil Heat.

The steadily growing public preference for Timken is based on one thing: *Homeowners are convinced that Timken quality is the best possible buy.*

And the value of the Timken Dealership Franchise grows, as town after town becomes a *Timken Town.*

The Royal Family of Oil Heating



OIL
BURNERS



OIL
BOILERS

TIMKEN
Silent Automatic
OIL HEAT

TIMKEN SILENT AUTOMATIC DIVISION
The Timken-Detroit Axle Company
JACKSON, MICHIGAN



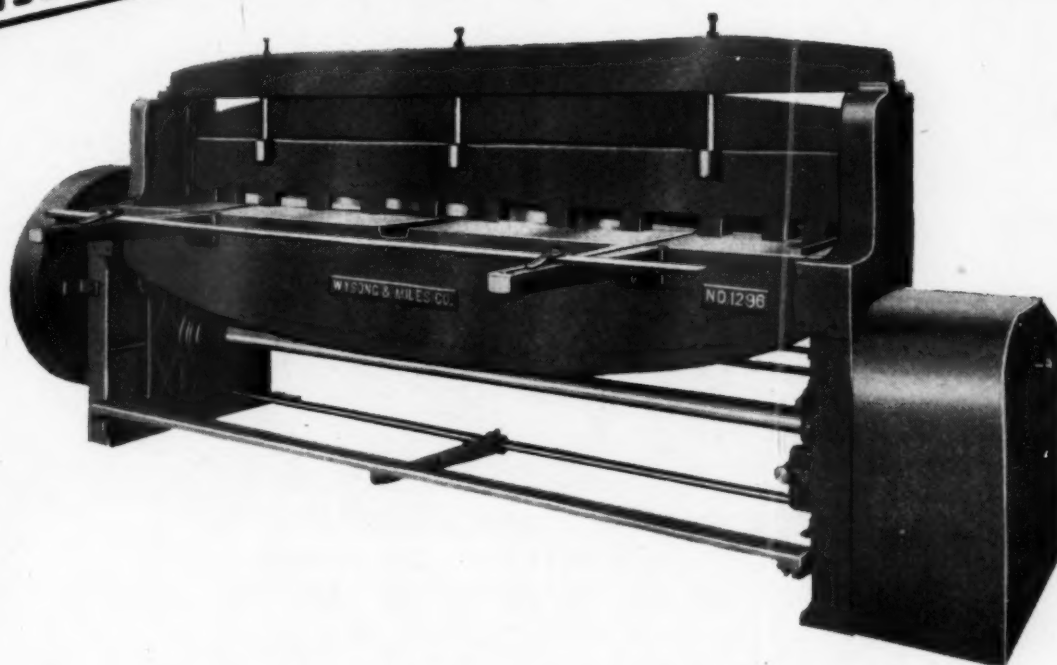
OIL
FURNACES



WATER
HEATERS

**NEW
LARGER
HEAVIER**

SHEAR!



THE WYSONG AND MILES No. 1296, 8 Foot - 12 Gauge

POWER SQUARING SHEAR with NEW PRECISION FEATURES

COMPENSATING HOLDDOWN: Firmly clamps to prevent slippage of sheets of uniform or varying thicknesses, or small strips that come only under one foot. Each holddown foot clamps independently through an individual spring activated plunger. Different gauges can be sheared without adjustment.

PRECISION BACK GAUGE: WYSONG and MILES ball-bearing, parallel back gauge is quickly adjusted to .0078 (1/128th) of an inch by a dial reading.

MULTIPLE DISC CLUTCH: Treadle-activated friction clutch has a quick pick-up with a minimum of shock and jar, even on a full load. As an added safety feature the clutch can be set for non-repeating and a second stroke cannot be made unless the treadle is depressed a second time.

MASSIVE CONSTRUCTION: The bed, end housings, top cross-member and knife bar are heavy, well-ribbed, semi-steel castings. Rigid, balanced construction throughout insures accurate alignment and prevents twist, spring or deflection.

Other fine WYSONG and MILES Squaring Shears in 10, 12, 14 gauge up to 8 feet. Write for complete illustrated information.

WYSONG and MILES Co

GREENSBORO, NORTH CAROLINA

THE FINEST IN SQUARING SHEARS AND BENDING ROLLS

ANY FIRING RATE FROM PILOT TO HIGH FIRE, AS SMOOTHLY AS A MOTION PICTURE



The BREESE HORIZONTAL BURNER WITH

Rheotrol ★
NOW MAKES
MANUAL CONTROL PRACTICAL

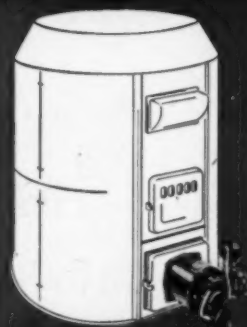
FOR WARM AIR AND HOT WATER HEATING SYSTEMS, COOKING RANGES AND MANY OTHER APPLICATIONS WHERE STEADY FIRING IS DESIRABLE.

THE RHEOTROL synchronizes air and oil adjustment, providing maximum combustion efficiency at all firing rates. Modulated flame means a steady flow of economical heat . . . NO COLD 70.

Write today for descriptive literature and technical data.

Automatic, thermostatically-controlled models also available for heating and many other applications.

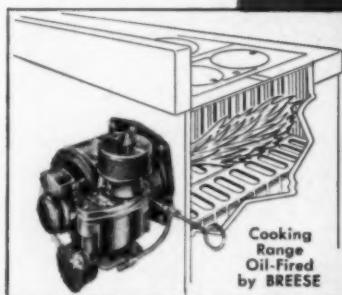
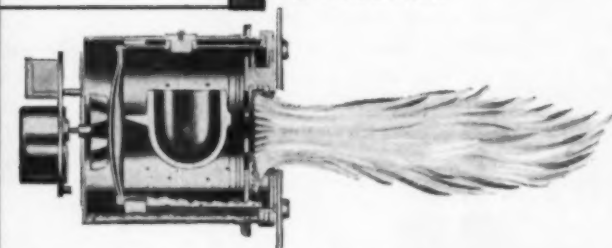
★ TRADE MARK



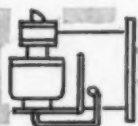
Gravity
Furnace
Oil-Fired
by BREESE



Heating
System
Oil-Fired
by BREESE



Cooking
Range
Oil-Fired
by BREESE

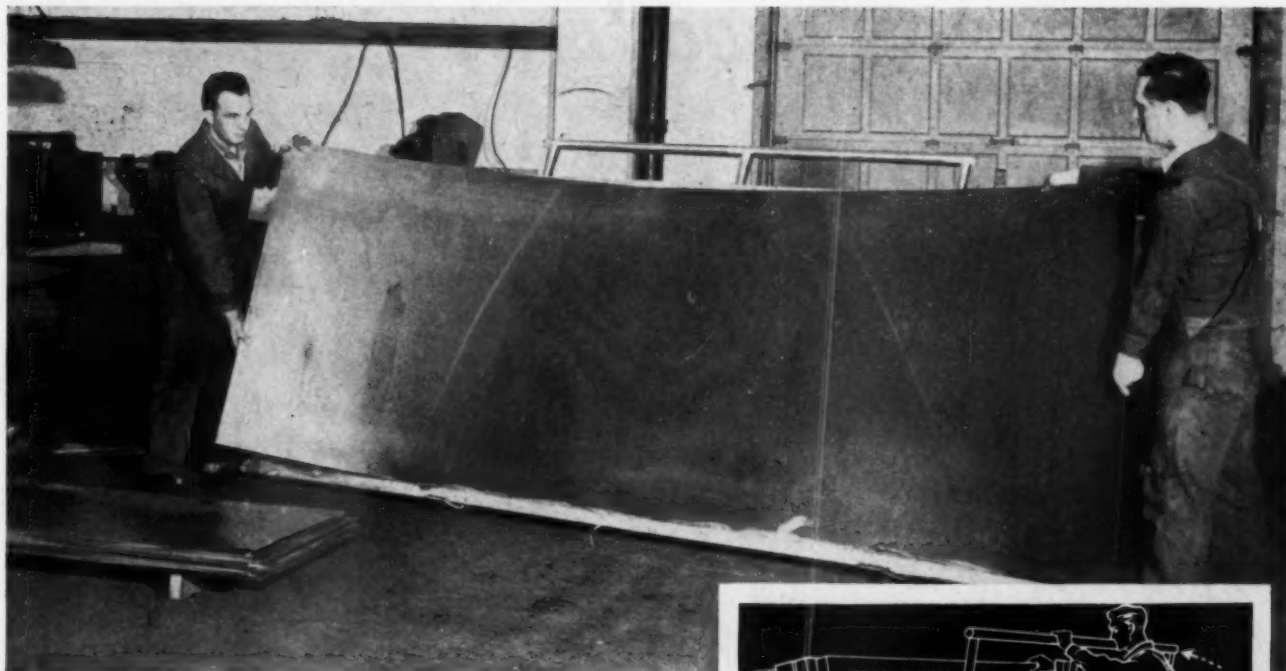


BREESE BURNERS inc.

341 EAST OHIO STREET CHICAGO 11, ILL.

FORMERLY OIL DEVICES

RESEARCH AND ENGINEERING
SANTA FE, NEW MEXICO



ROL-AWAY

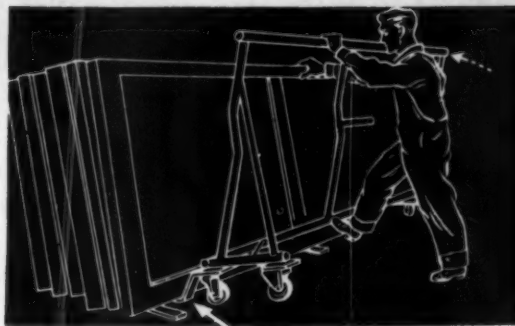
Specially Designed for Handling SHEET METAL

Specially designed for handling long flat materials, Rol-Away is a natural for working with sheet metal and metal tubing. Whole crates can be loaded at one time and taken off as used, thereby saving floor space. These lightweight aluminum trucks come in two size models with capacities of 2400 to 3000 pounds. The jumbo Rol-Away is especially adaptable for fire doors, extra large steel sheets and over-size crates. Easy-to-operate, Rol-Away does a job that would normally take at least three or four men.

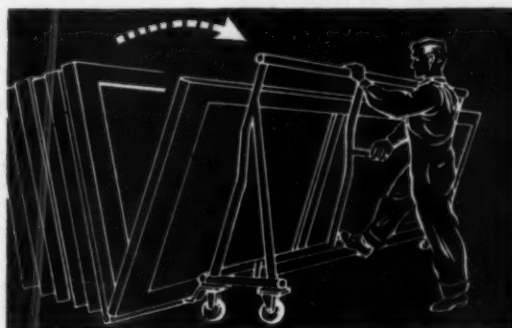
- Rolls in any direction
- One man operation
- Lightweight
- Saves labor
- Saves space
- SAVES EXPENSE



DEALER FRANCHISES AVAILABLE



ONE MAN easily operates Rol-Away. Above view shows operator approaching load.



JUST TILT backward and load is in position to be rolled away.

SEND FOR ILLUSTRATED FOLDER

Gentlemen: Please send me free illustrated folder on Rol-Away truck.

Name

Firm

Address

City State

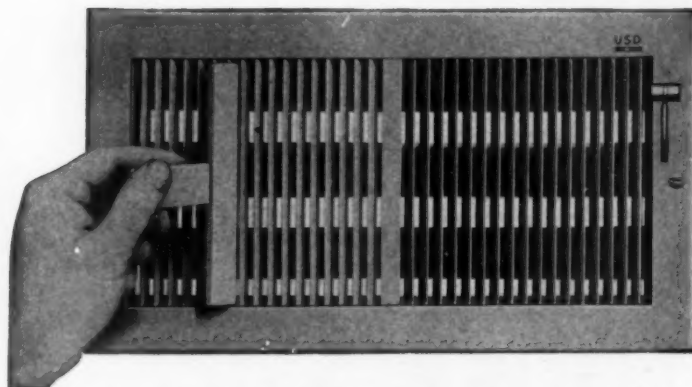
BEALL PIPE & TANK CORP.

NEW PRODUCTS DIVISION

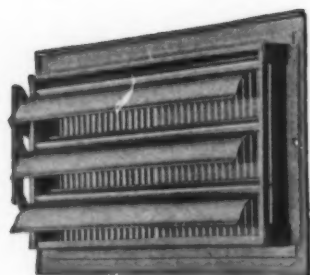
SALES OFFICES: 1945 N. Columbia Blvd.,

Portland 3, Oregon

(“4400” Line) Auer **AIRO-FLEX**



No. 4432 Airo-Flex Adjustable Register



Back view of Airo-Flex
No. 4432 Register



There is good reason for the popularity of this Auer Airo-Flex "4400" Series of air conditioning registers. This has long been one of our leading models, because it fulfills every requirement of efficient 4-way directional operation—without the fancy frills (or the fancy cost) sometimes associated with this type of register. It has horizontal multi-louvre deflecting blades to regulate up-and-down flow, with indicator on face showing blade position. Its vertical grille bars are easily adjusted to desired lateral angles, with turning tool. In eye appeal, perfection of finish, and careful craftsmanship, it rates with the best, and does credit to *any* job. Available for wall or baseboard use with intakes to match.

Auer makes a complete line of quality registers for all warm air and air conditioning purposes. Ask for Auer Register Book—or special Catalog "C" on flat stamped metal grilles.

The Auer Register Company, 3608 Payne Avenue, Cleveland 14, Ohio

Auer
REGISTERS
 & GRILLES for AIR CONDITIONING & GRAVITY



FLORAL CITY HIBOY FURNACES KRES-KNO *Ball Flame* BURNERS

TWO LEADERS GET TOGETHER

FOR BETTER HEATING OF SMALL HOMES,
Bungalows, Gas Stations,
Stores and Offices

Many leading furnace manufacturers use—

AUTOMATIC KRES-KNO BALL FLAME VAPORIZING OIL BURNERS (Type "SET") in their units for perfect combustion, greater efficiency, improved heating economy.

Prominent among them is FLORAL CITY HEATER CO., Monroe, Michigan, makers of HIBOY FURNACES.

Manufacturers - Distributors - Dealers. This is your cue for greater sales activity and higher profits.

KRES-KNO BALL FLAME BURNERS are available in ½ gal., ¾ gal. and 1 gal. sizes. Here is a line of burners that offers price, quality and performance second to none.

Manufacturers of warm air furnaces, water heating and steam boilers, bucket-a-day heaters, stoves, heaters of all kinds—Ball Flame Burners are priced so that they can be used as an integral part of your units. Special models and sizes are available to meet your specifications.

Distributors—Write for our attractive sales plan on packaged units for manual or automatic operation.

Dealers—You can now offer a low price burner to meet Competition—a quality burner which is simple to install. Contact your distributor or jobber—or write direct to us.

KRES-KNO *Ball Flame*

AUTOMATIC VAPORIZING OIL BURNERS (TYPE "SET")—are packaged—readily adaptable to manufacturers' units—simple to install for conversion.

The *Ball Flame* patented principle of mixing vaporized oil and air by forced draft gives amazingly high combustion efficiency and operating economy.

A new, improved automatic control valve adjusts quantity of air to the proportion of oil burned. Graduated amounts of air and oil are delivered by a two speed motor. Thermostatic controls can be furnished when needed.

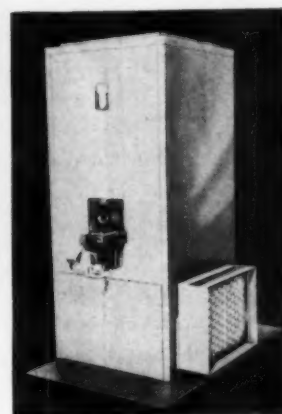
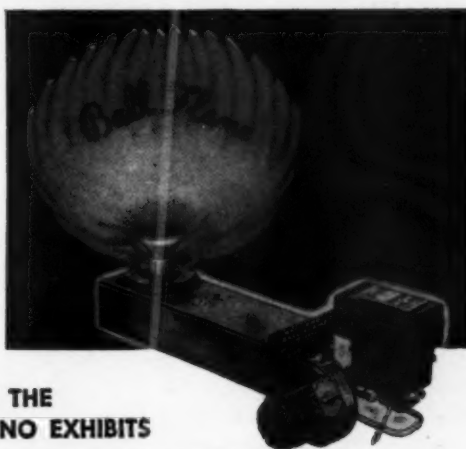
For LARGER Homes

A new model *Ball Flame* Burner, BFS 60 for heating average size homes has just been introduced. It can be applied to furnaces up to 1 gal. maximum capacity.

Ball Flame Burners have been approved for use with #1 and #2 commercial grades of fuel oil by Underwriters Laboratories, Chicago, Board of Standards and Appeals, New York City, Commonwealth of Massachusetts, Canadian Standards Association and the department of combustibles or fire authorities in all the principal cities and states as well as in many foreign countries.

VISIT THE KRES-KNO EXHIBITS

Heating & Ventilating Exposition
New York City, February 2-6
•
OIL HEAT EXPOSITION
Chicago, April 5-8



THE FLORAL CITY HIBOY FURNACE



KRESNO-STAMM MANUFACTURING COMPANY

Oil Burning Equipment . . . Since 1927

General Offices and Plant: 335 Commercial Avenue, Palisades Park, N. J.
Canadian Offices: 1452 Drummond Street, Montreal—Factory, Granby, Quebec
European Offices and Plant: Roscommon, Eire



"KEY PEOPLE"—When You Need Steel

Ryerson's function is not only to supply your steel, but to deliver it on time. From the moment the Ryerson switch-board flashes your incoming call until the steel is laid down in your plant, a corps of helpful, intelligent employees well-trained in the Ryerson "Immediate Steel" tradition are at your service.

The likeable young women at the switch-board, phone-order salesmen, dispatchers, crane operators, skilled warehousemen who cut, shear and shape stock sizes to fit your specification, truck drivers—all of them are key people at Ryerson—key people in your service, when you need steel!

In spite of shortages, we are putting forth every effort to serve all Industry to the best of our ability. Naturally, many sizes and certain products are out of stock. However, for the most part you can depend on Ryerson for immediate shipment of a wide range of steel products.

PRINCIPAL PRODUCTS

Bars—hot and Cold rolled	Mechanical Tubing	Tool Steel
alloy steel	Boiler Tubes and Fittings	Wire, Chain
reinforcing	Allegheny Stainless—	Bolts, Rivets
Structurals	sheets, plates, shapes,	Babbitt
Plates—	bars, tubing, etc.	Metal Working Tools
Inland 4-Way Floor Plate	Sheets and Strip Steel	& Machinery, etc.

JOSEPH T. RYERSON & SON, INC., Plants: New York, Boston, Philadelphia, Detroit, Cincinnati, Cleveland, Pittsburgh, Buffalo, Chicago, Milwaukee, St. Louis, Los Angeles

RYERSON STEEL

AMERICAN ARTISAN

RESIDENTIAL
AIR CONDITIONING
WARM AIR HEATING
SHEET METAL CONTRACTING

1927—FWA . . . 1947—CAC

TWENTY years ago, when he was vice president of the Warm Air Furnace Company, J. C. Miles presented a discussion in *AMERICAN ARTISAN*, December 31, 1927, titled "Forced Warm Air Heating Has a Definite Place in the Warm Air Heating Industry." At the time, forced warm air heating was in an elementary stage of development, but twenty intervening years have proven the accuracy of his statements.

His prediction: "... if we will fit ourselves for forced air heating we will broaden our field and expand our volume of business," has become fact, substantiated by the sales volume and public acceptance our industry realizes today.

Continuing, Mr. Miles diagnosed: "After all, furnace troubles are circulation troubles. If we can insure circulation, we can insure satisfaction." His prescription, the furnace fan (eventually the furnace blower), provided the means to recognize public demand for clear basements, fewer repairs, and heating remote spaces in large buildings.

The Miles Furnace Fan system was a combination forced air-gravity system. Like the patient who decided to increase his dosage to speed his recovery, we soon abandoned gravity circulation and designed for large volumes during the periods the blower was in operation. In the recent past, this meant six air changes per hour at design temperature. At all other times the blower operated intermittently, and it was not uncommon to find intermittent blower operation during periods of burner operation. Here was the zenith of intermittency and the nadir of *indoor comfort*. This produced surges of heat while heat loss was continuous.

Periodic and excessive air circulation produce periodic velocity disturbances in the occupied space. While it is true that high rates of air recirculation produce more constant temperatures throughout the occupied space, experience has proven that temperature distribution does not recognize the discomforts from excessive velocities, for these do not register on the dry-bulb thermometer. There must be a compromise between the two. Evidence now discloses that warm air heating cannot remain in public favor unless air mo-

tion in the occupied zone is kept within tolerable limits and heat input is continuous. This is not a vague public demand. It is real, for once the body becomes accustomed to new comforts it becomes critical of the new conditions. From experience of the past, it appears that this will always be so. We cannot remain static.

The staff and committees of the National Warm Air Heat and Air Conditioning Association have recognized these problems and present the Continuous Air Circulation program as a solution. This method of adjusting forced warm air heating systems was thoroughly explained in our November issue by Professor S. Konzo. In addition a manual of procedure will be available from headquarters of the association.

The program merits the support of all elements of the warm air heating industry because continuous air circulation and continuous heat input are fundamental concepts of comfort. It recognizes the desirable features of gravity heating—and insures all the added advantages of forced air heating. It insures continued public acceptance of our products and opens new markets by providing new concepts of *indoor comfort*.

C A C is not a cure-all. It is not a substitute for engineering, experience, or skill. It will place new demands upon us, comparable to those of forced air heating twenty years ago. It will contribute to our status because the "book of rules" will not provide all the answers.

In some cases, C A C will accent the problems of air distribution. This does not mean it will create a problem. Instead, it will force us to recognize an engineering problem we have long overlooked. We have looked too long at the thermometer as the sole criterion of *indoor comfort*. Optimum temperatures may satisfy us—but do they satisfy the customer's cause for complaint?

The C A C program merits your immediate acceptance as routine procedure for the adjustment of all forced air heating systems. The pages, staff, and sources of information of *AMERICAN ARTISAN* are open to your questions, problems, experiences, and discussions on Continuous Air Circulation.

★ ★ ★ ★ ★ ★ ★ ★ ★ ★

Arnold Kruckman's

Washington Letter

★ ★ ★ ★ ★ ★ ★ ★ ★ ★



Reactions to Truman's Message

THIS is written just after hearing—and seeing—the President tell the Joint Session of the Congress what they should do about the relief of Europe, and even more emphatically, what is needed to control inflation here at home. As is customary in these unusual convocations of the Congress, the House chamber—in which it was held—and the galleries were theoretically jammed. The word theoretically is used to make clear that actually neither the Floor nor the Galleries were crowded to the extent your news reports may lead you to believe. This effort at telling you the truth as it appeared to one correspondent is directed at you through your trade journal because the facts may have a bearing on your thought as it has an effect on your business.

The President, as Harry Truman, is an extremely attractive person. A business man who sat beside your correspondent at a White House conference the other day remarked he would be an ideal partner at bridge, or a grand guy with whom to have an evening of poker. He is dapper, looks keenly friendly, and makes you think of those slickly garbed, good mixers you meet at the Kiwanis, the Lions, or the Rotarians luncheons. It would be difficult not to call him Harry at the first meeting. When he speaks in public, even in the Halls of Congress, he sounds and looks like a businessman delivering remarks at a lunch meeting. He is a typical composite of an inland City business man. Obviously, the authority and the stupendous power that envelops the President of the United States makes him impressive. But also, even in Congress, at such historical events as this opening assembly of the Joint Session of the Specially Called Congress, the man, Harry Truman, is not impressive. He has a kindly dignity, but you cannot hear his voice in all reaches of the Congressional chamber, and he does not personally dominate the gathering. The essence that you get at this session is the almost complete lack of enthusiasm of the Members of the Congress as well as the guests in the Galleries. Part of this negation is, of course, Truman's inability to play up to the part of the President in its world-shattering implication of power and dramatic

significance; the other part undoubtedly is the distaste most of the Members of the Congress have for the job of re-imposing the controls which he demands.

Speech Coolly Received

The mously polite applause which only once or twice studded his reading of his address was arresting when you bore in mind that there still are a substantial number of his own party in the Congress, and that there are many Liberals on both sides of the aisle. The applause befitted the appearance of the Head of the great nation of the world as he walked down the center aisle to the rostrum, surrounded by the Congressional Committees; there was scarcely any applause when he finished his momentous paper, and only another befitting farewell salvo as he walked out of the House with the same escort. Of course, every one in the House arose as he entered and as he left, but that greeting of respect was conventional, and was no different, in essence, from the greeting they gave in a similar manner to the Diplomatic Corps, and the Cabinet, as they rather sheepishly stalked in, behind the pudgy little man, who acts as Master of Ceremonies for these processions.

You may get more of the feeling of the atmosphere by this: Representative Robert Crosser, D., of Cleveland, Ohio, gets around in a wheelchair. He brought it up close to the side of the rostrum, only a few feet away from the place where the President spoke. Repeatedly the Congressman napped, and fell forward so far in his chair that this correspondent was constantly afraid he might fall out and sprawl on the floor. On the Left, in the front row of seats, sat the members of the Senate. Senator Bob Taft, naturally, was conspicuous. He was doubly conspicuous because you feared every moment he might let out a long and bored yawn.

Crosser is an important Democrat, and Taft is the leading Republican on the Republican Policy Committee. It is fair to assume both reflect the temper of their Parties. It is probably fair to assume that the absence of any spontaneous applause, or reaction, from

the visitors' galleries reflects the temper of the public. Public sentiment probably will not be sharply defined until the debate jells thought clearly and crystallizes in simple issues. It is difficult to assume anything except that the fundamentals of the program proposed by the President will be adopted. We will have wage, rent, price, and rationing controls, at the consumer level. This means, in essence, there is an emergency, an emergency springing out of the world situation as well as the conditions at home; and it is not unlikely that we will be forced into a situation which will require that the Congress devise a law which in name or substance will be a State of Emergency.

Administration of Controls

Who will be selected to administer the law unquestionably will be the factor which will join the issue which may profoundly determine the direction in which our political system will go in the future. This issue probably will be the battleground for the greatest struggle ahead in Congress, even if it is camouflaged. The military sincerely hold controls should devolve upon them, in the light of the crisis unfolding in world affairs. There are already high Army and Navy officers, usually on leave (not retired) in key posts in every Department and Office of the Federal Government. Both Army and Navy have Industrial Colleges, well staffed, and highly organized. All branches of the National Defense Department are organizing work armies as part of the Organized Reserves. Gen Eisenhower is regarded as the most popular potential for nomination on some Party ticket for the Presidency. He is popular with the veterans, we are told here. Gen. MacArthur is unpopular with the veterans, according to Washington information, but has made a record that is almost flawless as an Administrator in the Asiatic area. The politicians are beginning to talk more in terms of candidate popularity than in the social, political and ideological significance of the popular candidates. Side by side with apprehension about the danger of Communism, we are beginning to hear rumbles of fear of Fascism. In the Congress itself there are men like Bertrand (Bud) Gearhart, of California, senior Republican Member of the Ways and Means Committee, and a powerful part of the Republican Policy Committee, who thinks, and says, it is high time those of us who believe in our pristine Democracy should boldly stand forth and demand that our system be kept headed straight for individual liberty; freedom to do business without interference; freedom to live and do business competitively; and freedom to do business under the system of Capitalism. Gearhart, unlike many others, would not give an inch to any of the modifications introduced by the New Deal, and others. He holds we should revive the system which has made this country what it is today, and which has imposed upon it the role of world saviour. There is little doubt this philosophy will play a striking part in the debates ahead in Congress. Bear in mind, the philosophy is the belief in the undiluted Democracy; the Democracy without any modifications of socialism, communism, fascism, or any other ism. Just pure and simple American Democracy.

Public Is Unenthusiastic

The Galleries strikingly illustrated the tone and

temper of the occasion. They were apathetic, undemonstrative, and uncolorful. They were not even dignified. They were a vivid cross-section of our national tempo and spirit today. They reflected curiosity more than any other quality. There were large numbers of women. That drama, color, parade, and glitter, and social altitude of an earlier day, were absent. This was a show by and of the shifting America of this day. The whole, the Floor and the Galleries, was more like a national political convention in session than an assembly of the "most august legislative body on earth." And like these conventions, the mechanics were poorly managed. The ushers were incompetent, and their incompetency deprived the guests of their proper seats. This was really unhappy because all seating was by ticket; at least in theory. Most of the seats were obtained by those who had the aggressiveness to bluff the ushers and grab the seats. It was like a battlefield in the constant flashing of the camera guns, and the cannon-like things that projected over the railings to catch sound for the various transmitters. In minuscule, it was a county fair and a convention, with a thin veneer of pomp but not circumstance. But withal it was something of which we are proud, the unique and original concentrate we call the United States of America. It faintly reflected the past, vividly incarnated the present, and adumbrated the future: history, romance, the living pulse, and ominous portents of what may come. It seems important to this reporter that you, as a business man, should feel what happened here because it may give you the feel of what is happening in your America. Like the myriads of wires on the switchboards of a gigantic telephone exchange, this particular day of the special session of the Congress focussed within the House all the various and complicated interests that are shaping the destiny of the United States. Only God knows what the mechanism of Government will do with the load.

Plan Arouses Opposition

As anticipated, the President's plan to resume controls has stirred up extraordinary opposition. Republicans almost to a man, in the Congress, are vocally against the "police state"; a surprising number of Democrats are outspokenly in opposition. The report here is that the National Association of Manufacturers, the United States Chamber of Commerce, and many other national trade and industrial organizations have organized a solid push against the controls among a majority of the business interests of the country. The objection most frequently heard is that the controls will re-establish the black markets. Apparently people do not perceive that a black market is actually a much more limited institution than the inflationary increases in prices for scarce commodities and supplies. Inflationary markets are in essence highly magnified black markets which the law cannot touch. More inflation obviously will bring on the greatest smash in the world's history. Controls appear to be the only remedy any one has been able to suggest. But controls bring with them the uncertainties which may spell a change in the constitution of our political system. With the retirement of Gen. Eisenhower, it has been announced that Gen. Omar N. Bradley, head of The Veterans Administration, becomes Chief of Staff.

(Please turn to page 148)

NEWS SUMMARY OF THE MONTH

Indoor Comfort Conferences Expand

IN 1948 the *Indoor Comfort* Conferences sponsored by the National Warm Air Heating And Air Conditioning Association have been expanded to cover three days rather than the two day schedule that was used in 1947.

This expansion has been made necessary by the additions made to the subject matter of the conferences. Instruction will be given in the use of Manual 7-A for the design and installation of warm air ceiling panel systems (radiant panel heating); use of the new Manual 9 for large residential, commercial and industrial warm air heating systems; instruction in the use of the new Short Forms based on Manuals 5 and 7 (a quicker method of designing residential gravity and winter air conditioning systems) and information on merchandising heating equipment.

All this has been added to the practical heating fundamentals that were so well-received last year and the result will be a program that is even more valuable to the heating contractor in meeting competition from other types of heating equipment. The instruction is adapted to suit the local climatic conditions which vary widely in the area covered by the conferences—from Duluth to Atlanta and from Boston to Denver.

California Gas Supply Increasing

MORE natural gas will be distributed in northern and central California by the Pacific Gas and Electric Company of San Francisco on completion of a new pipeline from Texas. A five-year contract has been set up by which the P.G. and E. will receive 75 million cubic feet per day, beginning early in 1948 and 100 million cubic feet in 1949.

This has been made possible by the construction of a pipeline by the El Paso Natural Gas Company, a pipeline 1200 miles long and costing more than \$70,000,000. Capacity of the new line is 305 million cubic feet a day.

The use of natural gas has gone up tremendously since it was introduced into northern and central California in 1929. In 1932 34½ billion cubic feet were used as against 145½ billion cubic feet in the year ending June 30, 1947.

VA Trains Convalescent Veterans

AS AN aid to rehabilitation and convalescence the Veterans Administration has been offering some of the patients in VA hospitals correspondence courses in air conditioning and metal construction, among other construction subjects.

These courses give the men something to do that is interesting and provides mental stimulation as well as starting him on the road toward the acquisition of skills that will increase his value to his community when he is well enough to return home. In many cases, it is claimed, these courses actually speed the patient's recovery.

Post-War Housing Totals

DAVID S. MILLER, president of the Producers' Council, an organization of manufacturers of building materials, addressed a meeting of architects in New York city and gave figures showing that the increase in home building after World War II had been much greater than that after World War I.

Permanent type housing units started in the first two years after the most recent conflict were estimated at 1,495,500 or 124 per cent of the 1940 rate. In contrast with this, 652,000 homes were started in 1919 and 1920 or 95 per cent of the 1916 rate. Moreover, in recent months home building has been proceeding at a rate of 900,000 units a year, a figure which was not approached until the seventh year after World War I, 937,000 units being started in 1925.

Gas Sales Gain in September

THE AGA report of gas sales for the month of September shows a gain of 1.9 per cent over September, 1946. For a twelve-month period ending September, 1947 total gas sales were 28,510,083,000 therms, an increase of 10.4 per cent over a year earlier. This figure represents 182 per cent of the 1935-1939 average.

FHA Approves Aluminum for Ducts

ALUMINUM has come to the fore as a material for use in air ducts for heating, ventilating and air conditioning systems of all types principally as a result of the dearth of galvanized iron for that purpose. But the extensive use of aluminum has proven that it is not merely a substitute material but can meet competition on its own merits.

Now the Federal Housing Administration has taken cognizance of this fact by approving the use of aluminum for ductwork in a supplement to FHA's "Use of Materials Bulletin UM-1." This supplement includes alloy specifications, minimum thicknesses for both enclosed and non-enclosed ducts as well as construction and installation requirements. Use of aluminum hangers and fastenings is also recommended.

Construction Volume Declines

ACCORDING to an October report of the F. W. Dodge Corporation, compiler of building statistics, contracts awarded for construction in the thirty-seven states east of the Rocky Mountains during the first three quarters of this year totaled \$5,626,111,000, representing a decline of 6 per cent from the total reported for the corresponding nine months of last year.

Projects classified as publicly owned are running substantially in advance of 1946, accounting for 29 per cent by dollar volume of all building and construction contracts reported in the thirty-seven states for the first three quarters.

Partnerships and Your Income Tax

By Arthur Roberts

Pompton Lakes, N. J.

TO APPRAISE the possibility of reducing their income tax, many warm air heating dealers and sheet metal contractors have asked us about partnerships, so we offer this counsel to those who are mulling over in mind the desirability of effecting partnerships to attain tax economies.

Partnerships are not taxed as separate entities. Each member is taxable as an individual, nevertheless, a partnership must file a return on Form 1065 showing gross income and net income and filing is required whether there is a net income or not. A partnership may file on a calendar or fiscal year basis but the books must be kept accordingly. A partner must report his share of ordinary net income of the firm even though he uses a cash receipts and disbursements basis for filing and the partnership files on an accrual basis. Any partner may file a return but errors or fraud involve all partners.

You determine gross and net income the same as on an individual return. Capital gains and losses are separated from ordinary net income of the partnership and carried into the net income of the individual partners where they are treated as other capital gains and losses. Contributions, payments to a partner for services or interest on capital invested are not deductible on a partnership return. Each partner makes such deductions on his individual return. A partnership cannot take advantage of the carry-back and carry-over loss provisions. Each partner handles this net operating loss deduction on his personal return.

Lowering Surtax Rate

The formation of a partnership may bring the surtax income to a lower surtax bracket and this is where savings may be effected. Instead of the income being reported by one individual in a high surtax bracket, as with a proprietorship, it is reported by two or more persons in lower surtax brackets. Many taxpayers form partnerships with members of their families to effect this reduction. Some states permit wives to become partners with husbands upon oral agreement only. Consult the law of your state on this matter but remember that you must always be in a position to prove that a partnership exists and this is done best by written agreement. Insofar as income tax matters are concerned, the Federal law prevails. In Texas, for example, a joint stock association is considered a partnership but the Commissioner of Internal Revenue held it taxable as a corporation.

Partnerships are generally defined as ventures between two or more individuals who combine their

ability, services and money for profit or loss. The characteristics of a true partnership are:

1:—Each member is personally liable for the debts of the group except in limited partnerships.

2:—Each member may act as an agent for others and bind them to his acts.

3:—Consent must be obtained from all partners to admit another.

4:—Death, retirement or legal incompetency of a partner dissolves the relationship.

If these conditions are not present, the tax authorities will probably class the organization as an association and tax it as a corporation, even if unincorporated.

Status of Family Partners

Although the government is not overly keen about family partnerships and scrutinizes such arrangements closely, it admits that partnerships so organized are not necessarily subject to condemnation because of the close relationship of the interested parties. One warm air heating dealer and his son were partners and agreed that each of the taxpayer's daughters should have a 1/5 interest in future earnings of the firm, the daughters agreeing to share the losses and render services. The government recognized this partnership as bona-fide even though the daughters were not given an interest in the profits accumulated over past years or a share in the ownership of the assets. The government held that the agreement for sharing the profits and losses and the giving of the services was sufficient to establish a partnership. Warm air heating dealers and sheet metal contractors may be guided by this finding in determining whether the partnership they may contemplate will pass muster at the income tax office.

Another method utilized is for a partnership member to create a sub-partnership with one or more of his family or to assign a part of his distributive income to such. The Supreme Court refused recognition to a sub-partnership because the wife in the case did nothing that made her a partner. In other words, it seems that a partner must do something, invest money, give services, etc., to be considered a partner in the eyes of the income tax office—but how much money or time so spent is not fixed. A partner cannot side-step tax liability by assigning his interest in the partnership to someone else. To get this relief, the recipient of his interest must become a member of the firm. Where a gift of such interest is made, the recipient may become a member of the firm upon consent of the other partners, then the donor is not taxable.

WAGE INCENTIVE PLANS

Guiding Principles

THE Management Consultant Division of the War Production Board, during the war, issued a set of "Guiding Principles for Wage Incentive Plans," which have been found to be sound and workable. A summary of these principles follows:

1. In establishing an incentive plan, all available scientific and engineering ability should be used, combined with a sympathetic attitude toward human relations.
2. Incentive plans should have the continued attention of top executives.
3. Management and the bargaining agency, where there is one, should be in real agreement as to the adoption or modification of the plan.
4. The plan should be simple and understandable by the workers.
5. Production should be increased as well as wages.
6. Unit labor costs should not increase appreciably.
7. Standards should be developed on the basis of detailed time studies where practicable.
8. Management should establish the production standard as the amount of work performed per unit of time by a normal qualified operator under normal conditions.
9. Provisions should be made for changing production standards whenever changes in methods, material or equipment require it. The union should understand such changes and have opportunity to appeal them through grievance machinery.
10. The setting of temporary standards should be kept at a minimum. It should be clear to all that the standards are only temporary.
11. Except for technical changes and temporary rates, production standards should not be altered unless by mutual agreement between the company and employee representatives.
12. Ordinarily, management should pledge that the basic hourly rates which existed prior to the plan would become guaranteed rates of pay under the plan.
13. When production standards are properly set, good practice has demonstrated the desirability of adopting an incentive payment in which incentive earnings are the same proportion above basic rates as production is above standard. Thus, if production is 20 per cent above the established standards, the increase in pay or bonus is 20 per cent. However, with crudely estimated standards, this distribution might disturb wage levels and cause restricted production. In such cases, agreements are often made

to share the results of increased production. For example, if production is a given percentage above standard, an agreed upon lesser percentage is paid as an incentive bonus.

14. In general, incentives applying to individuals and small groups are more effective than those applying to large groups.
15. Where it is felt desirable to include indirect workers in the plan, the indirect man-hours in some way should be correlated with some measurable unit, such as total production or direct employee hours, so that indirect labor overhead costs may be kept under control.

Pitfalls

Although it is almost universally true that a wage incentive plan will increase production and save manpower soon after it is installed, it is also unfortunately true that a carelessly conceived or poorly maintained plan is likely to bog down, cause bad labor relations, and end in restricted production. It is a fact that there are many plans all over the country which have been operating for years on an unscientific basis, with lack of proper management attention and accompanied by recurrent labor-management disputes.

Wage incentive plans are methods of paying workers in some degree for their effort, but it is not always simple to establish a measurement of effort. Therefore, a wage incentive plan is neither a perfect device nor a panacea. It cannot be said that differences of opinion do not arise between management and labor regarding the fairness of standards. They surely do.

When intelligent and reasonable individuals from management and labor are involved in the consideration of such questions, these questions are faced and reconciled.

Management and labor alike have looked to wage incentive plans as panaceas for economic ills of all kinds. Many in labor see wage incentives as the only feasible way of securing higher earnings; many managements wish to make use of them either to hold workers or to attract them from elsewhere.

If a management should make use of wage incentives to exploit and deceive employees, or if labor should refuse reasonable cooperation with management or should lay plans to see that productivity is restricted below a fair day's work, there will be difficulties. There are instances where labor-management relations are so poor that it is distinctly advisable to delay the installation of a wage incentive plan.

Paradoxical as it may seem, some of the possible concomitants of a wage incentive plan may be re-

Reprinted from WPB "Handbook of Wage Incentive Plans."

stricted production. Such restrictions, of course, have always tended to exist when workers are paid by the hour. They stem from fear that if some individuals perform what they feel is a fair day's work, others will be forced by management to do more than they, themselves, would care to do—thus turning out too much production, which, they believe, will in some manner result in less job security and more unemployment.

These traditional feelings are often reinforced by poorly conceived and poorly maintained incentive plans. Thus, wage incentives for individual workers or for groups should not be instituted without full understanding of the consequences, and unless management is prepared to set its standards to the greatest possible extent on the basis of facts, with engineering preparation and with thorough understanding and cooperation on the part of labor.

"Tight" and "Loose" Standards

The chief requisite of a sound wage incentive plan is probably the establishment of standards which truly and continuously measure effort. If standards are set "too tight" or "too loose," difficulties arise. Standards which seem to be "too tight" are likely to result in discouraged efforts and decisions to hold back productivity until adjustments are made. Standards which appear to be on the "tight" side at least have the advantage of being bound to come to the surface, where they can be investigated and either explained or rectified.

Many standards are, through carelessness or poor judgment of management, set "too loose." At other times, standards which were originally representative of a fair day's work become vitiated due to changes in method, equipment or material, but are not changed to fit the condition.

In these cases, where, for one reason or another, standards become "too loose," if workers apply themselves and earn much more than was originally anticipated by either labor or management, jealousies are likely to occur which tend toward an easing up on the part of the worker. Thus very often, limits are set, either by union edict, by groups of workers, and often by apprehensive foremen or other supervisors, so that production which might have been attained with proper standards is never reached.

Today, to be sure, almost no managements are to be found which are not willing to guarantee tasks or rates of production per man-hour against change unless there is a change in materials, method, or equipment. However, when for one reason or another some rates in a shop are set so that workers can earn \$2, \$3 or \$4 an hour where it was agreed that \$1 an hour was the proper pay for a reasonable day's work, there is clearly trouble ahead. Harmony is not likely to exist in a shop where some are earning \$1 an hour and others on equivalent jobs, twice as much.

The natural and usual result is that production is pegged at some point which is felt expedient; for example, somewhat over the \$1. Though such pegging is often participated in by some supervisory person who has been in error, just as often management never learns how much could be readily turned out.

Changing the Production Standards

Since the condition of restricted production is unfortunately widely prevalent, there is no danger of exaggerating its importance. Yet management can cure such a condition only by the use of great care and experience in the first place. Once a rate is set, management must accept it with its corresponding cost. If management alters the rate, then immediately it loses the workers' confidence and cooperation.

Correction is, moreover, possible. There are records of situations where union leadership has been broad enough so that these circumstances have been talked out with management and mutual adjustments made. Often workers dislike to see the savings due to corrections of such errors go into increased profit. One possible means of meeting this objection is to set up a temporary fund for a specified purpose into which the savings may go.

It is a fact that there are many plans all over the country which have been operating for years on an unscientific basis, with lack of proper management attention and accompanied by recurrent labor disputes. With these conditions cured and with the one-third added production per man-hour which we might expect if industries now on day work saw their way to change to wage incentives, we should go a long way toward solving our problems of widespread shortages.

Need for Industrial Engineering

In every plant, in every department, some individuals or some group is deciding daily what the day's effort will be. Is it better that it be decided by tradition, by guess, by prejudice, by chance, by greed, by fear? Or is it better that management and labor face the problem honestly and courageously and allow the most scientific, logical, and common-sense solutions to prevail?

The installation of a wage incentive plan entails acceptance by management of the responsibility for keeping the plan up-to-date. And this involves hard work. A wage incentive plan either poor in itself or poorly administered will cause many new unfavorable conditions; a sound plan, on the other hand, through increased productivity of our industrial system and through increased utilization of labor will benefit labor and management. The benefits of a sound wage incentive plan more than repay the difficulties of its installation.

Thus, wage incentives should not be instituted without full understanding of the consequences. Management should be prepared to set its standards to the greatest possible extent on the basis of facts, with engineering preparation, and with thorough understanding and cooperation on the part of labor.

To be most successful a wage incentive plan should involve:

1. A foundation of properly evaluated basic wage rates.
2. A determination of the best methods of performing operations.
3. The establishment of fair time allowances as standards for their performance.
4. The determination of the most advantageous relationship between productivity and incentive wages.

(Please turn to page 154)

Rochester Apprentice Standards for Open Shops

These Standards of Apprenticeship, developed by Non Union Master Sheet Metal, Furnace and Roofing Contractors' Association of Rochester and its members have as their objective the training of skilled mechanics in Sheet Metal Work.

It has been recognized by this Association that to train skilled mechanics there must be a well developed plan of work experience, supplemented with related instruction. This recognition has resulted in the development of this Apprenticeship Program in accordance with the Standards recommended by the New York State Apprenticeship Council.

It is the desire of the Association to cooperate with all who are interested in the training of apprentices, in an effort to assure the apprentice, if he will apply himself to the learning of the trade, the opportunity to become a highly skilled craftsman.

SECTION 1

DEFINITIONS

(a) "Apprentice" shall mean a person at least 16 years of age, who has agreed to work at and learn the trade of Sheet Metal Work, and who is covered by a written agreement with the employer.

(b) "Employer" shall mean the firm or the company which is a member of the Non Union Master Sheet Metal, Furnace and Roofing Contractors' Association.

(c) "The Registration Agency" shall mean the New York State Apprenticeship Council.

(d) "Supervisor of Apprentices" shall mean the person designated by the employer to perform the duties outlined in these Standards.

(e) "Apprenticeship Agreement" shall mean a written agreement between the employer and the person employed as an apprentice, which agreement shall be registered with the Registration Agency and shall contain a statement covering the terms and conditions of the employment and training; a statement of the trade to be learned; a schedule of the work processes; a requirement that the apprentice receive supplemental instruction in subjects related to his trade for at least 144 hours a year for each year of his apprenticeship; and a clause making all the terms and conditions of these Standards a part of each Apprenticeship Agreement with the same force and effect as if expressly written therein. Every Apprenticeship Agreement shall be made out and signed in quadruplicate; one copy for the Employer; one copy for the Apprentice; and one copy for the Registration Agency; and one copy for the Committee.

(f) "Parties to the Apprenticeship Agreement" shall mean the apprentice (and his parent or guardian, if he

is a minor) and a duly authorized representative of the employer; each of whom shall be required to sign the Apprenticeship Agreement.

(g) "Standards of Apprenticeship" shall mean this entire document, including these definitions. These Standards and definitions have been developed in accordance with the recommendations of, and will be registered with, the New York State Apprenticeship Council.

(h) "Committee" shall mean the Apprenticeship Committee as set up by these Standards.

SECTION 2

POLICY

On and after the date of the signing of these Standards it shall be the policy of the Non Union Master Sheet Metal, Furnace and Roofing Contractors' Association of Rochester and its members, that all apprentices are to be employed in accordance with the terms of these Standards of Apprenticeship.

SECTION 3

QUALIFICATIONS FOR APPRENTICES

Applicants for Apprenticeship must meet the employment requirements of the Association and be:

1. Not less than 16 years of age.
2. Physically able to perform the work of the trade.
3. Preference will be given honorably discharged veterans of World War II.

SECTION 4

TERM OF APPRENTICESHIP

Apprenticeship is offered in the trade listed below and for the term as stated:

(Trade) Sheet Metal Work	8000 hours.
--------------------------	-------------

During the term of apprenticeship all apprentices are required to receive supplemental instruction in subjects related to their trade for a minimum of 144 hours per year. For all purposes under these Standards, 2000 hours shall be considered as equivalent to one year.

SECTION 5

PROBATIONARY PERIOD

The first 1000 hours, or approximately 6 months after the signing of the Apprenticeship Agreement, shall be a probationary period. During this probationary period, the Apprentice Agreement may be cancelled by the Registration Agency, upon written request of either party. After the probationary period, the Agreement may be cancelled by the Registration Agency upon the written request of both parties thereto or upon adequate cause being shown by either party.

SECTION 6

CREDIT FOR PREVIOUS WORK EXPERIENCE AND EDUCATION

All persons now employed as apprentices will be placed under these Standards. Credit on the term of apprenticeship for previous Work Experience and Education may be granted an old or new employee, if, after a careful examination of his Work Experience, education and other qualifications, such qualifications are found to meet the requirements of this program for such advanced standing. Such credits as may be granted shall be set forth in the Apprenticeship Agreement.

Apprentices who are granted credit for previous experience shall be paid, upon signing the Apprenticeship Agreement, the wage rate for the period to which such credit advances them.

SECTION 7

HOURS OF WORK

Apprentices shall work the same hours and be subject to the same conditions as the skilled workers in their trade who are employed by the Association. In case an apprentice is required to work overtime, he will receive credit on the term of apprenticeship for only the actual hours worked. Apprentices will not be required to work overtime on days when classes in related instruction are scheduled.

SECTION 8

SUPERVISOR OF APPRENTICES

The "Employer" shall designate a Supervisor of Apprentices who may be a foreman or journeyman Sheet Metal Worker.

It shall be the duty of the Supervisor of Apprentices:

- (a) To see that apprentices are moved through the work training processes that are set up in these Standards;
- (b) To see that no apprentice is retained on an operation for a period longer than the time scheduled;
- (c) To maintain a record of all apprentices showing the distribution of time on the various work processes, the progress made in such work process, and the aptitude he displays;
- (d) To review the record of the apprentices' attendance in classes of related instruction from reports received from the Board of Education;
- (e) To cooperate with everyone concerned in aiding the apprentice in mastering the trade;
- (f) To see that an Apprenticeship Agreement is executed before the apprentice begins work.

SECTION 9

RECORDS

Adequate records shall be maintained for all apprentices, showing the distribution of time on the various work processes; the progress made in each work process, and the aptitude displayed by the apprentice; together with a report of attendance at and progress in classes of related instruction.

For this purpose, record cards may be obtained from the Registration Agency, without cost. These record cards include a one-year work and supplemental instruction record book furnished the apprentice, in which he will keep a daily record of hours worked on

each type of operation of his trade. The foreman will verify these entries by initialing. At the end of each month the foreman will rate the apprentice's performance for the month. At the end of each month of related instruction, the instructor will record, in this book, the apprentice's progress in related supplemental work.

On the Apprentice Master Record Card, supplied at no cost with the above one-year record book, a summary of each month's record of the Apprentice's progress in the shop and supplemental instruction is posted, from the one-year record book, and is kept by the Committee.

SECTION 10

APPRENTICESHIP AGREEMENT

Four copies of every Apprenticeship Agreement shall be made out, signed and forwarded to the Registration Agency for approval and registration. When registered, the Employer and the apprentice each receives one copy, while one copy is retained for the files of the Registration Agency, and one copy by the Committee.

Every Apprenticeship Agreement entered into under these Standards of Apprenticeship shall contain a clause making the standards a part of the agreement, with the same effect as if expressly written therein. For this reason, every applicant (and his parent or guardian, if he is a minor), shall be given an opportunity to read these Standards of Apprenticeship before he signs the Apprenticeship Agreement.

SECTION 11

RATIO OR NUMBER OF APPRENTICES

One apprentice may be employed for every two journeymen regularly employed in the trade.

SECTION 12

WAGES

Apprentices shall be paid not less than the following minimum rates per hour:

- 1st 1000 hours or approx. 6 months, 35% of journeyman's wage rate;
- 2nd 1000 hours or approx. 6 months, 40% of journeyman's wage rate;
- 3rd 1000 hours or approx. 6 months, 45% of journeyman's wage rate;
- 4th 1000 hours or approx. 6 months, 50% of journeyman's wage rate;
- 5th 1000 hours or approx. 6 months, 55% of journeyman's wage rate;
- 6th 1000 hours or approx. 6 months, 60% of journeyman's wage rate;
- 7th 1000 hours or approx. 6 months, 70% of journeyman's wage rate;
- 8th 1000 hours or approx. 6 months, 80% of journeyman's wage rate.

Minimum journeyman's rate as of July 1, 1946, is \$1.35 to \$1.67½ per hour.

SECTION 13

WORK EXPERIENCE

Apprentices shall receive instruction and experience on the machines and processes listed in the attached Appendix A. It is understood that they shall be given a sufficient variety of experience and instruction in all branches of their trade to develop practical, skilled, all-round mechanics.

The schedule of work experience established therein shall be recognized as sufficiently flexible to be changed if the accumulated experience indicates that a change will be to the advantage of the apprenticeship system or if the work of the employer requires that a change be made.

SECTION 14

RELATED SUPPLEMENTAL INSTRUCTION

(a) All apprentices shall be required to receive supplemental instruction in subjects related to their trade for a minimum of 144 hours per year during each year of the term of apprenticeship. It is recommended that, where possible, the schedule of hours should be for 4 hours per week, 36 weeks per year. Apprentices shall not be paid for the hours spent in classes of related instruction, and this time spent in related supplemental instruction shall not be considered as hours of work.

(b) In case of failure on the part of any apprentice to fulfill his obligations as to related instruction attendance, the Registration Agency may suspend or revoke his agreement upon notification by the employer of such conditions.

(c) When the related supplemental work of the apprentice is not of the calibre necessary to proficiency relative to the trade being followed, such deficiency will be called to the attention of the employer by the responsible authorities.

(d) The related instruction shall be arranged for by the New York State Department of Education in cooperation with the local school authorities, and, when established, shall be under the supervision of the local school authorities.

(e) The course content of the related instruction shall be determined by representatives of the employer in conjunction with the New York State Department of Education and the local school authorities.

(f) The related instruction shall cover subjects listed in Appendix B.

SECTION 15

TRANSFER OF APPRENTICES

In the event the employer through lack of work lays off an apprentice, he shall endeavor to place the apprentice with another contractor and notify the committee of such occurrence. If the employer is unable to find other employment for the apprentice, it shall be the duty of the committee to do so. In all such cases the original employer shall have the right to recall the apprentice on one week's notice. The committee shall notify the Registration Agency of any such transfer.

SECTION 16

CONSULTATION SERVICE ON APPRENTICESHIP PROBLEMS

Should a question arise as to the interpretation of these Standards, which cannot be satisfactorily settled between the apprentice and the Committee, either party may consult with the Registration Agency.

SECTION 17

CERTIFICATE OF COMPLETION

Upon the satisfactory completion of the requirements of Apprenticeship as established herein, the Committee shall certify the names of graduate apprentices to the Registration Agency and recommend that a Certificate

of Completion of Apprenticeship be awarded by the New York State Apprenticeship Council.

SECTION 18

MODIFICATION OF STANDARDS

These Standards of Apprenticeship, which shall be registered with the New York State Apprenticeship Council, may be revised or modified at any time, provided that no such change shall alter an Apprenticeship Agreement in force at the time of such change without the written consent of the apprentice. The Registration Agency shall be advised of any and all such changes.

SECTION 19

APPRENTICESHIP COMMITTEE

The general administration of these Standards shall be the responsibility of the Apprenticeship Committee. This Committee shall be composed of three members appointed by the Non Union Master Sheet Metal, Furnace and Roofing Contractors' Association of Rochester, N. Y.

The Committee shall select its own chairman and secretary, determine the time and place of regular meetings and adopt such other administrative procedures as may be necessary to carry on its duties.

The duties of the Committee shall be:

(a) To cooperate with the Employer and the Supervisor of Apprentices to the end that apprentices will attain the work experience and related instruction as set up in the standards.

(b) To hear and adjust all complaints of violation of apprenticeship agreements.

(c) To recommend advancement of apprentices to a higher wage rate after considering the report of the Supervisor of Apprentices.

(d) To recommend to the Registration Agency that a "Certificate of Completion of Apprenticeship" be awarded to those apprentices who have satisfactorily completed their term of apprenticeship.

(e) To recommend such changes in these standards as may be necessary from time to time to improve the training of apprentices.

APPENDIX A

BASIC WORK TRAINING SCHEDULE

General Sheet Metal Work.....	1000 hours
Operation of hand tools and	
power machines	500 hours
Exhaust and blow pipe work.....	500 hours
Ventilation and air conditioning.....	1000 hours
Roofing, spouting and guttering.....	1000 hours
Cornice and skylights.....	1000 hours
Gravity and forced-air furnace work,	
and servicing the same.....	1000 hours
Warm air heating.....	500 hours
Special installation and specialty work.	500 hours
Welding	500 hours
All around work.....	500 hours

Total..... 8000 hours

APPENDIX B

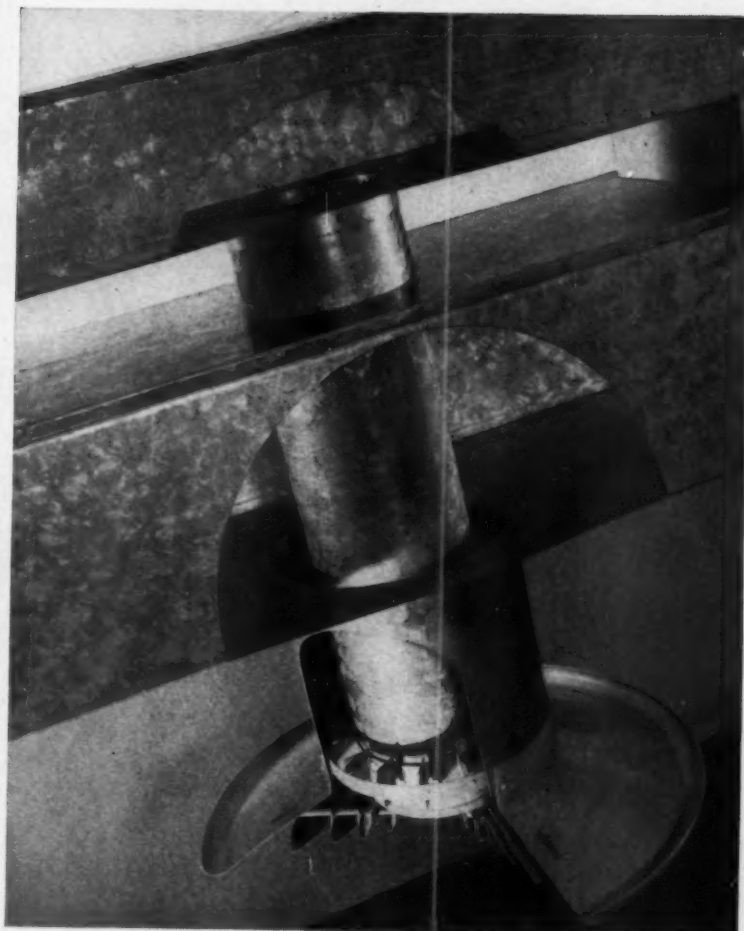
RELATED INSTRUCTION

Materials and methods of construction, shop mathematics, sketching, blueprint reading, layout work, course in safety.



RESIDENTIAL AIR CONDITIONING *Section*

DEVOTED TO HOME AND SMALL COMMERCIAL AIR CONDITIONING



the

l be
ship
pro-
dice-
ange
The
l all

shall
ttee.
bers
etal,
of

and
ular
pro-
s.

per-
will
n as

tion

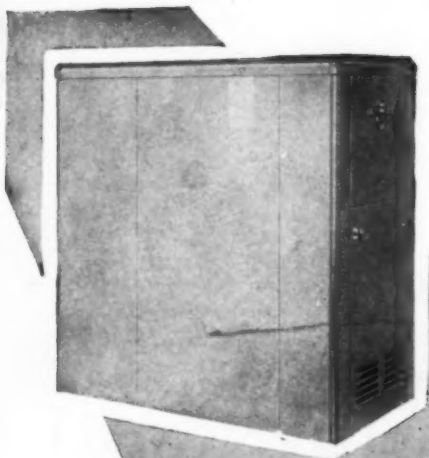
to a
the

that
' be
orily

ards
the

rs
rs
rs
rs
rs
rs
rs
rs
rs
rs
rs
rs

the-
work,



Waterbury

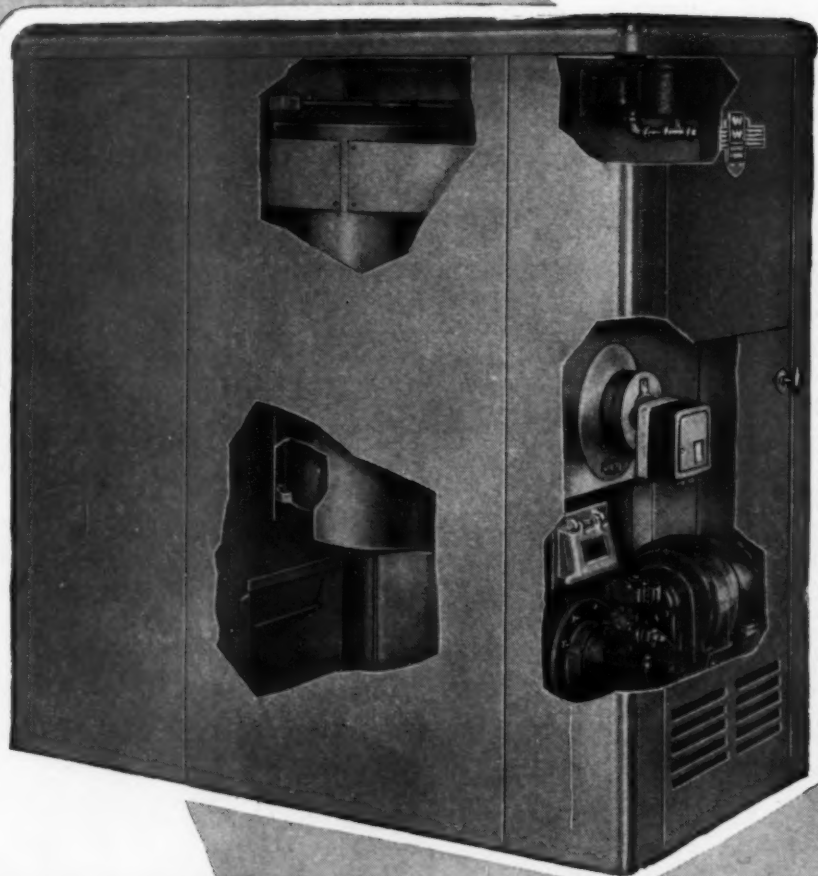
Oil Fired Air Conditioner

Whether you are installing a simple gravity job or the most complete air conditioner, it's what's under the casing that counts for your customer's satisfaction—and for a trouble-free sale for you.

It's
What's
Under
the Casing
that
Counts !

A modern compact, attractive unit, economical to buy—economical to operate. It is enclosed in an eye-appealing casing that is a compliment to the most modern basement—but what is equally important to you—because of the efficiency and quality of what is **UNDER** that casing, you are saved annoying service calls.

Furnaces for every size home and every type fuel — from gravity models to complete air conditioners.



THE WATERMAN-WATERBURY COMPANY

1122 Jackson St. N. E.

Minneapolis 13, Minn.

Insulation For Air Conditioning Ducts

By R. C. Nason
Long Island, N. Y.

OWNERS of buildings that were equipped with air conditioning at the time of erection are much more fortunate than those who find it expedient to add such a feature to an existing structure. The addition of an air distribution system to a building that made no provision for one in its original design is a task that is causing many headaches to dealers throughout the country. It often reaches a point at which the use of exposed ducts is the only means of avoiding very excessive costs for such an installation.

Protecting Ducts

These exposed ducts, in turn, require proper protection which is usually provided by insulation. Methods of application and materials used vary greatly and are generally influenced by the shape of the duct to be insulated. Most ducts are rectilinear and so slab or board materials are suited to such an application. But elbows, offsets and other curved surfaces do not lend themselves to treatment with flat materials so such curved parts are covered with asbestos cement or mastic.

Black mastic makes a good cover for the outside of the insulated duct when appearance is not a factor to be considered. Frequently, however it is necessary for ducts to harmonize with their surroundings and in this case a canvas jacket is effective since it can be painted to match most surfaces. There is an inherent disadvantage in the use of canvas jackets for exterior work because they tend to shed their waterproofing surface from the action of the elements. Thus, it is necessary to treat such jackets at occasional intervals to restore their ability to shed water.

Cooling a Diner

One of the illustrations with this article shows a comfort-cooling duct that was installed on a diner.

Rather sizeable, it is 24" x 36" x 20 ft. and carries the cooled air from the cooling unit at the left to the dining room on the right. The sheet metal contractor who made the installation covered the duct with a 2 in. rockwool slab on which was placed a waterproof brown canvas jacket. It has been in use for several years and the results have been completely satisfactory. Even the color of the duct is in harmony with the color scheme of the diner itself.

Another view shows an installation on top of an animal hospital. In this case the contractor used round ducts and planned to cover them with 1½" flat, cane-fiber insulating material. As a preliminary step, however, he installed square wooden frames on the ducts, as seen. The insulating material does not hug the duct and the air space contributes to the efficiency of the insulation. The elbows were covered with 1½ in. of asbestos cement. As a finish, two coats of aluminum paint were applied, topped with an exterior coat of black mastic.

Efficiency of Insulation

Losses from exposed ducts depend upon the thermal conductivity (k value) of the insulating material used, its thickness, temperature difference (gradient) between the average air temperature within the duct and the surrounding air, and of course, the care with which the material is applied. When ducts are exposed to outside air, it is generally agreed that at least 2 in. of insulation is the minimum thickness that should be used. The labor cost remains practically constant regardless of thickness of the material, so the added efficiency of thicker material makes it economically practical.

A manufacturer of glass fiber material lists its k value as .24 Btu. Its thermal lower case resistance is calculated by the equation:

The photo on the left, below, shows the installation on an animal hospital that is described in the text—the wooden frames around the ducts are clearly seen. At the right is the air cooled diner with its exposed duct.



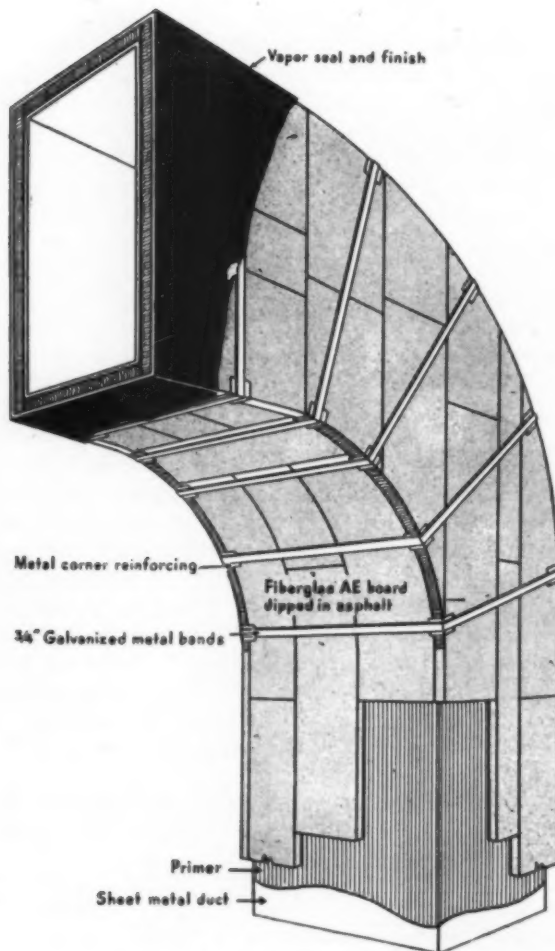
$$R = \frac{x}{k} \quad (1)$$

Where

R = thermal resistance for the thickness x .
 x = thickness of material, inches.
 k = thermal conductivity

Thus, for different thicknesses of the material, its resistance values from surface to surface are as follows:

Thickness	Resistance
1"	4.17
2"	8.33
3"	12.50
4"	16.66



Above is one recommendation for treating curved surfaces using insulating board material.

The overall air-to-air resistance of the insulated duct is calculated by the equation:

$$U = \frac{1}{R_1 + R_2 + R_3 + \dots + R_n} \quad (2)$$

Where

U = the overall coefficient of heat transmission.
 R_1, R_2 etc. are the individual resistances of the duct wall elements.

In the case of an insulated duct, the total resistance consists of the inside film, the galvanized steel duct, the insulating material and the outside film as indicated by equation (2). Each resistance is the reciprocal

of the thermal conductivity of the particular element.

When x is small and k is large, as in the case of the

metal of the duct itself, the resistance $\frac{x}{k}$, equation (1), may be neglected. The duct wall then may be considered as a single material of conductivity k and thickness x and the surface coefficients f_i and f_o . If we assume surface coefficients f_i and f_o as 3 and 6, respectively, the U value of the wall resolves to the simple equation:

$$U = \frac{1}{\frac{1}{f_i} + \frac{x}{k} + \frac{1}{f_o}} \quad (3)$$

Let

$$R_1 = \frac{1}{f_i} = \frac{1}{3} = .33$$

R_2 = the calculated resistance of the insulation, see table

$$R_3 = \frac{1}{f_o} = \frac{1}{6} = .17$$

Then

$$U = \frac{1}{.33 + R_2 + .17} \quad (\text{from eq. 2})$$

The U value for different thicknesses of insulating material may then be solved as follows:

Thickness	U
1"	.21
2"	.11
3"	.077
4"	.058

Example: An exposed duct 24" by 36" by 20 ft. is to carry 60 F (average) air to an air conditioned space with air surrounding the duct at 100 F. Determine the heat loss for 1" and 4" fiber glass insulation, respectively.

$$Q = UA(f_o - f_i)$$

Substituting the proper values we have the two equations:

$$Q = .21 \times 200 \times 40 = 1680 \text{ Btuh}$$

$$Q = .058 \times 200 \times 40 = 464 \text{ Btuh}$$

Application Techniques

When applying 4 in. insulation to ducts many air conditioning contractors prefer to use two 2 in. slabs of board rather than one piece of the full thickness. When this practice is followed it is usual to stagger the joints of the two layers and make certain that there is a good bond between the two sheets.

Some materials that are popular for exterior coating on ducts are mastics that can be applied hot, swabbed or brushed on; waterproof canvas jackets, sheet metal jackets and Portland cement. Some contractors use Portland cement plaster for bonding, treating interior as well as exterior surfaces of the insulation with it. In the process of applying insulating board to elbows and other curved surfaces it is often customary to cut the material to fit, dip the edges in asphalt to prevent edge loss, wire it to the duct and then apply the weatherproofing substance.

Correct Practice In Oil Heating

Part X [Warm Air Controls—Gravity and Forced Air—Sequence of Operation—Safety Features—Adjustment.]

By J. J. Mirabile

Delco-Heat Division

Elliott-Lewis Co., Philadelphia

MANY oil burner men are pleasantly surprised by the ease and simplicity which surround oil burner wiring. Many installers would build the combustion chamber, pipe the oil tank, set the oil burner, mount all the controls, and then call in the electrician. However, once these men had wired an oil burner installation they would readily understand the sequence of the operation of the controls. The operation of the controls is very simple. Always think of the relays, thermostats, and limit controls as plain switches. Their action is the same as the switch you use to turn on your living room light. However, the action is automatic. The switch can be thrown on or off by temperature changes which cause a bimetallic, or a hydraulic, element to expand or contract, producing the switching action.

Gravity Warm Air Controls

We will first describe the individual controls in a gravity warm air oil burner control circuit. The three controls and their wiring are shown in Fig. 1.

The Room Thermostat

The room thermostat shown is a three wire, low voltage, heat accelerated type. Its element is sensitive to temperature changes which cause the element to expand or contract. This movement opens or closes the contacts which control the flow of low voltage electrical current to the stack relay. The contacts are really a switch permitting the automatic operation of the oil burner. This low voltage current in the thermostat circuit is supplied by a transformer built into the relay. It is used to control the relay and also to perform several switching actions within the relay.

The Stack Relay

The stack relay controls the action of the safety switch, the starting (cold) and the running (hot) contacts, and the ignition and motor circuits. It relays the electrical currents to the various circuits in proper sequence. Its wiring is not complicated or difficult to understand. It is the heart of the wiring circuit. It is nothing more than a series of switches set into a sequence of operation when the thermostat calls for heat.

The High Limit Control

The high limit control shown is a two wire, high voltage type. It controls the supply of line voltage to the stack relay.

In a gravity warm air heating system, the high limit is actuated by the air temperature in the bonnet of the furnace. It will stop the burner when the temperature rises above the recommended setting (250 F) of the control. It is a switch which opens the line voltage circuit to the relay on temperature rise above its setting. This action takes place even though the room thermostat continues to call for heat.

The high limit is a safety control because it causes the entire control circuit to become inoperative and shuts down the burner whenever the bonnet temperature rises above the temperature setting of the control.

Forced Warm Air Controls

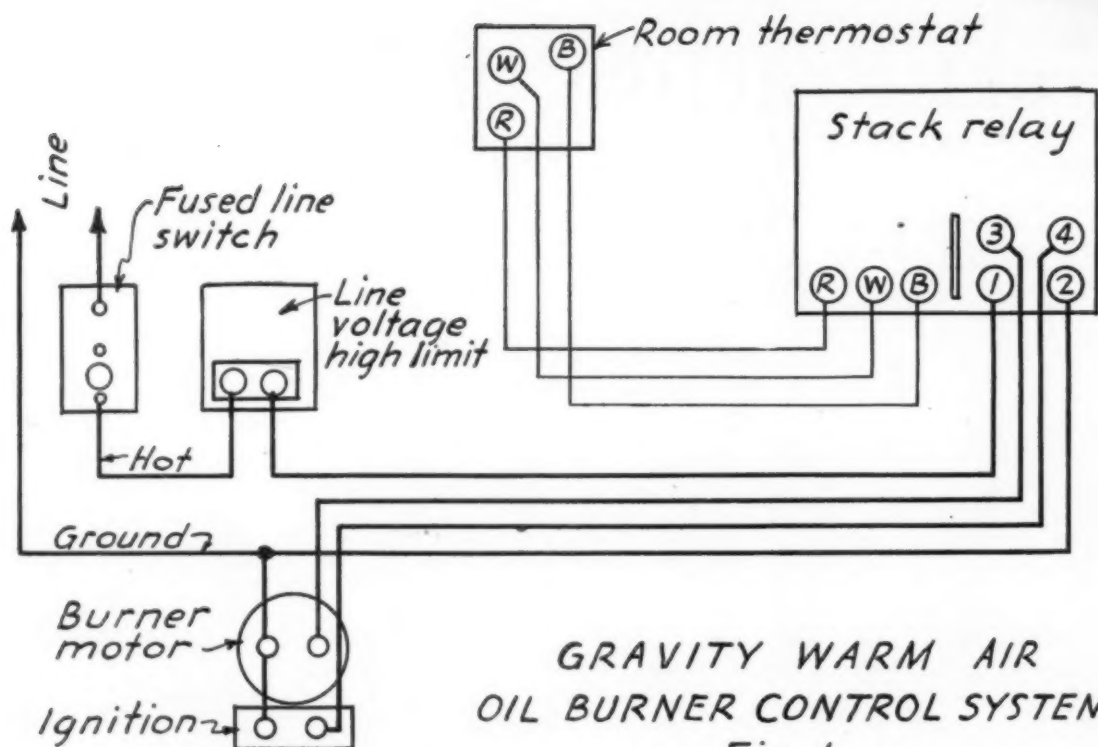
In addition to the three fundamental controls described in the preceding paragraphs, forced warm air oil burner control circuits require a switch to operate the blower, or fan, at a predetermined plenum temperature. Since this control is mounted on the plenum of the furnace, as is the high limit control, it is usually combined with the high limit as one integral unit—the combination blower-limit control. Its wiring, in conjunction with three controls already described, is shown in Fig. 2.

The Combination Blower-Limit Control

The combination control shown is a two wire, high voltage type. Provision is made for independent temperature settings of both the high limit and blower circuits. The combination control is actuated by the air temperature in the plenum of the furnace. It will start the blower when the temperature rises above the recommended setting for the blower, and stop the burner when the temperature rises above the recommended setting (200 F) for the high limit.

This control will stop the blower when the plenum temperature drops below the recommended setting for the blower as explained under "Forced Air Sequence."

The high limit controls in both the gravity and



GRAVITY WARM AIR
OIL BURNER CONTROL SYSTEM

Fig. 1

forced warm air systems will restart the oil burner when the plenum temperature drops approximately 25 F below the recommended setting for the high limit of each system provided, of course, that the thermostat continues to call for heat.

Sequence of Control Operation

The sequence of operation of oil burner controls is best described without going into all of the relay circuits. Briefly the operation of the controls is as follows:

The thermostat is connected to the relay with three low voltage wires, colored red, white, and blue. The red wire has a heater element, or resistance coil, in its circuit. The heater is under the thermostat cover and functions as follows:

When the room starts to cool the red and white contacts close. However, the relay is not energized until the temperature drops another fraction of a degree, closing the blue contact. Assuming the thermostat is set at 72 F, the white and red circuit is closed at 75 F—provided the thermostat is adjusted to a 3 deg differential. Thus the blue contact will close at 72 F. The closing of the blue contact energizes the relay. When energized, the relay closes circuits, or switches, which permit line voltage electrical current to flow to the oil burner motor and the ignition transformer, and low voltage current to the safety switch in the relay. A rise in temperature of the flue gases actuates a thermal element in the smokepipe. The movement of the element opens the cold (starting) contacts and closes the hot (running) contacts. At the start, current flows through a heater element in the safety switch getting this switch ready to shut down the burner in case of flame failure. However, with the opening of the cold contacts and the closing of the hot contacts, there is

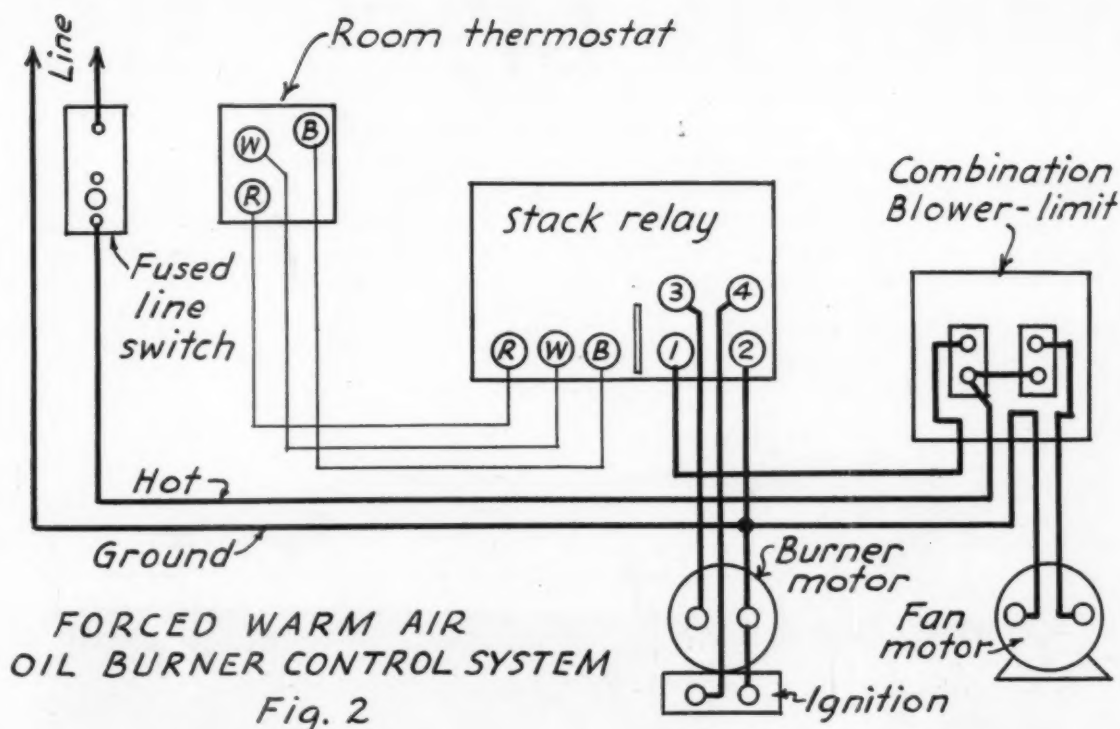
evidence of flame and so, the current is shunted around the heater element of the safety switch. A further rise of flue gas temperature opens the relay circuit controlling the current supply to the ignition transformer, thereby cutting off the ignition of an intermittent ignition control system.

The oil burner is now in normal operation. The thermostat is calling for heat, the high limit control is standing by and the relay will permit the burner to continue to operate. With a slight rise of room temperature, the blue contact of the thermostat will open. The relay will continue to operate the burner because the thermostat circuit continues as a closed circuit through the red and white wires. This is the holding circuit.

Heat Acceleration

The heater element in the thermostat now begins to generate heat. This artificial heat will cause the element in the thermostat to open the red and white contacts which causes the relay to stop the burner. The heater does not function when the blue contact is closed because this contact permits the current to flow along the lines of least resistance. When the blue contact breaks, the current is forced to flow through the heater element and generate heat.

There are many advantages inherent in heat accelerating thermostats. Without the heater element in the thermostat, room temperature would rise to the thermostat setting before its contacts would open and shut down the burner. During the operating period considerable heat would be stored in the furnace, and after shut down there would be overshooting from the flywheel effect of the mass of the heating system. Overshooting causes the burner to remain off for long



periods and at the next start considerable time must elapse before the mass and inertia of the system is overcome. This resolves into undershooting and overshooting of temperature. With heat acceleration, when the blue contact opens the heater begins to "fool" the thermostat, stopping the burner before the room is up to temperature. The flywheel effect is less and causes the burner to cycle more frequently. It provides more even temperature. This is very important in warm air heating.

The burner operation can be shortened or lengthened to suit the heating plant and the space being heated, by adjustments provided within the thermostat.

Flame Failure

If the flame goes out, it will cause a drop in stack temperature. This causes the stack element to open the hot contacts, stopping the burner. A further drop will close the cold contacts. This will cause the relay to send current to the safety switch, burner motor, and ignition. The burner will go into a normal start. If combustion does not occur, the hot contacts will not close and the heater element connected to the safety switch will cause the safety switch to open, stopping the burner. The safety switch is usually adjusted to stop the burner in approximately 90 seconds after a start without combustion. The burner will not restart without resetting the safety switch manually.

The sequence of operation of the stack relay involves a little more than that described, but its main function

is as explained and for all practical purposes it will suffice. The instruction sheet packed with the control gives detailed information about its operation and adjustment.

In both gravity and forced warm air systems, the high limit does not stop the burner unless the bonnet or plenum temperature rises above the control setting.

Forced Air Sequence

In addition to the sequence described for the fundamental and safe operation of the oil burner, forced warm air systems require a blower control which starts and stops the blower in accordance with the control setting and the plenum temperature. When the burner starts, the start of the blower will be delayed until the plenum temperature rises above the "on" setting; and when the burner stops, the blower will continue to run until the plenum temperature drops below the fan "off" setting.

The blower control should be adjusted to provide the greatest amount of blower operation—continuous air circulation. This requires adjusting the blower speed for approximately 100 F temperature rise through the furnace and setting the "off" indicator as low as possible without causing discomfort. The "on" indicator should then be set as close to the "off" position as the differential of the control will permit. Complete details of this procedure can be obtained from the Manual on Continuous Air Circulation issued by the National Warm Air Heating and Air Conditioning Association.

NEXT MONTH!

AMERICAN ARTISAN 1948 DIRECTORY ISSUE

OPEN FOR DISCUSSION

IT'S GETTING ALONG ABOUT THAT TIME OF YEAR



Reprinted from Sept. 22, 1947 issue, Des Moines Register

Business the Year Around

● Any man who has been in the heating business for only a few years can recognize the truth in J. N. Darling's cartoon which appeared in the *Des Moines Register* several months ago. We are all acquainted with the way the phone starts ringing on the first cold day in the fall. Roger Keith of the Keith Heating Company, Des Moines, Iowa, believes our industry should do something about fostering heating business the year around. His comments follow.—ED.

FOR about four years I have been concerned about keeping the interest of better men in the furnace business. It seems the only way to make the pay at-

tractive for year around men is to get the public to buy furnaces the year around which they are not now doing. If the public had the facts, they would prefer to have their furnace work taken care of in some of the slack months instead of concentrating all the demand for our services in late August, September, and October.

Last August our famous cartoonist J. N. Darling ("Ding") had a cartoon in the *Des Moines Register* lampooning the prices in the garage business, in these

days of car scarcity, so I suggested to him that a cartoon about the seasonal nature of the furnace business might help to promote and educate the public to have their furnace work done when better and experienced men are available. He thought enough of the idea to draw an excellent cartoon depicting our fall troubles. If some of the fall rush business could be obtained in April, May, June, and July, part of the seasonal aspect of the furnace business might be eliminated. This would retain men who might otherwise drift off to other sources of employment.

During the war we distributed a printed message urging homeowners to see to their heating needs in the off season. We called attention to the wild scramble on service companies like ours during the rush season.

If other contractors could be induced to take up this cudgel, we would eventually find better conditions in the industry.

ROGER KEITH.

Des Moines, Iowa.

Opposes Open Return Air

I AM in hearty agreement with E. Williams of New Toronto, Canada, when he says, "The fact still remains that a gravity furnace—properly installed—affords excellent service at low cost." However, I cannot agree that a customer should be permitted to set a price that necessitates the elimination of essential material and equipment, such as the return of air ductwork, so he can have dust filtering.

Mr. Williams says that the owner wants dust free air, positive heat, fire control, humidity, and as much room as possible in his basement. In addition, he claims that experience with furnaces installed as illustrated on page 82, October AMERICAN ARTISAN, provides access to the return air grilles, longer life of castings, warm basement, and 25 per cent improvement in furnace performance.

I cannot see that any of the above claims are met until a metal return air system is installed from each return air grille to the furnace casing, the valve removed from one supply register, and an automatic damper and limit control installed. It is also probable that insulation above the furnace would be required to meet local codes.

Warm air heating contractors have often, by the necessity of getting heat on as many jobs as possible, found it necessary to leave installations in a semi-finished condition and these experiences often reveal the value of the return air system. Reversal of air flow through an unconnected return air grille has not been an uncommon experience. Whether air will flow downward or upward through an unconnected return air grille is, of course, unpredictable because wind pressure and basement construction—infiltration to the basement—appear to be the determining factors.

Many non-essentials and gadgets around the small home will easily pay for the essentials of better warm air heating. This will resolve to the delight and profit of the homeowner and to the betterment of the entire warm air heating industry.

FRANK E. ANDERSON.

Terre Haute, Indiana.

ALL Departments of AMERICAN ARTISAN are open to warm air heating and sheet metal contractors. Manuscripts about all phases of your business: Management, Residential Air Conditioning, and Sheet Metal, may be submitted for acceptance as a contribution to the literature of the industry.

Here, on the "Open for Discussion" page, we invite your comments, questions, or answers to questions presented by other readers on published articles. This is your page for either formal or informal discussions which may be presented in the same manner as you would discuss current subjects with your fellow contractors.

Simply write a letter to the Editor, AMERICAN ARTISAN, 6 N. Michigan Avenue, Chicago 2, Illinois. Published discussions will be paid for at our regular manuscript rates.

Insulation Requirements

THE new Housing and Home Finance Agency has issued a pamphlet entitled "Performance Standards" which proposes performance standards for the structural elements of a house such as the floors, walls, partitions, ceilings and roofs. Also covered are some important standards on insulation requirements and heat loss limitation that we print here because of their considerable interest to our field. Copies of the booklet may be obtained from the Housing and Home Finance Agency, Washington 25, D. C.

201. Resistance to heat loss.

Means to reduce the heat loss of the dwelling, if necessary to attain compliance with Section 202 shall be provided. Such means may include—

- (a) Thermal insulation of exposed elements.
- (b) Weather stripping—permanently installed.
- (c) Caulking.
- (d) Storm sash, storm doors or double glazing.

202. Limitations to heat loss.

(a) The heat loss of the dwelling Btu per hour (exclusive of unfinished enclosed spaces) shall not exceed 60 times the total number of square feet of floor area. For purposes of calculation the floor area shall be measured to the inside faces of enclosing walls.

(b) The maximum acceptable coefficients of heat transmission are as follows:

- (1) Walls, exposed to outdoor temperatures

$$U = \frac{18}{70 - D}$$

- (2) Floors over unheated space

$$U = \frac{24}{70 - D}$$

(c) Floor slabs on ground under habitable rooms shall have moisture and vermin proof insulation around the perimeter, of maximum acceptable conductance as follows:

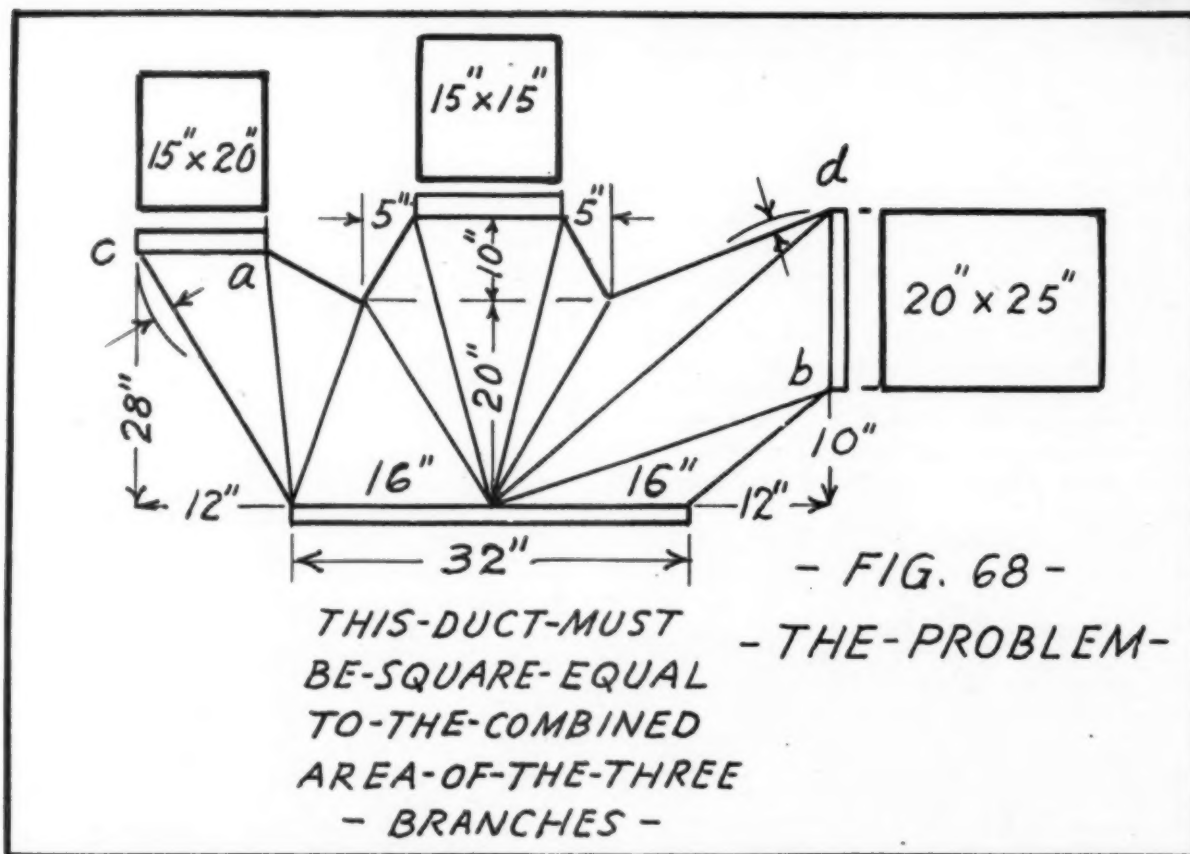
- (1) Ordinary slab floor on ground

$$C = \frac{48}{70 - D}$$

- (2) Slab floors used as radiant heating panels

$$C = \frac{32}{70 - D}$$

(Please turn to page 154)



Pattern Development for Air Conditioning Fittings *

By William Neubecker

Triple Branches Connecting To Square Duct

FIGURE 68 shows a reproduction of a three branch fitting for which patterns are requested. Three branches of the dimensions shown, connect to a main duct which must be square in section and must have an area equal to the combined area of the three branches.

Computing the Areas

Before proceeding with the layout the size of each square duct must be computed as follows: $15 \times 20 = 300$ square inches; $15 \times 15 = 225$; $20 \times 25 = 500$. $300 + 225 + 500 = 1025$ square inches area in the three branch ducts. $\sqrt{1025} = 32$ in. $32 \times 32 = 1024$ which is close enough for practical work.

Error in Sketching

In the sketch submitted in Fig. 68 the 15 inch side of the 15×20 branch cuts off on a horizontal plane and the 20 inch side of the 20×25 branch cuts off on a vertical plane. The outlet of these two branches will be *choked*, because no miter line or angle bisection has

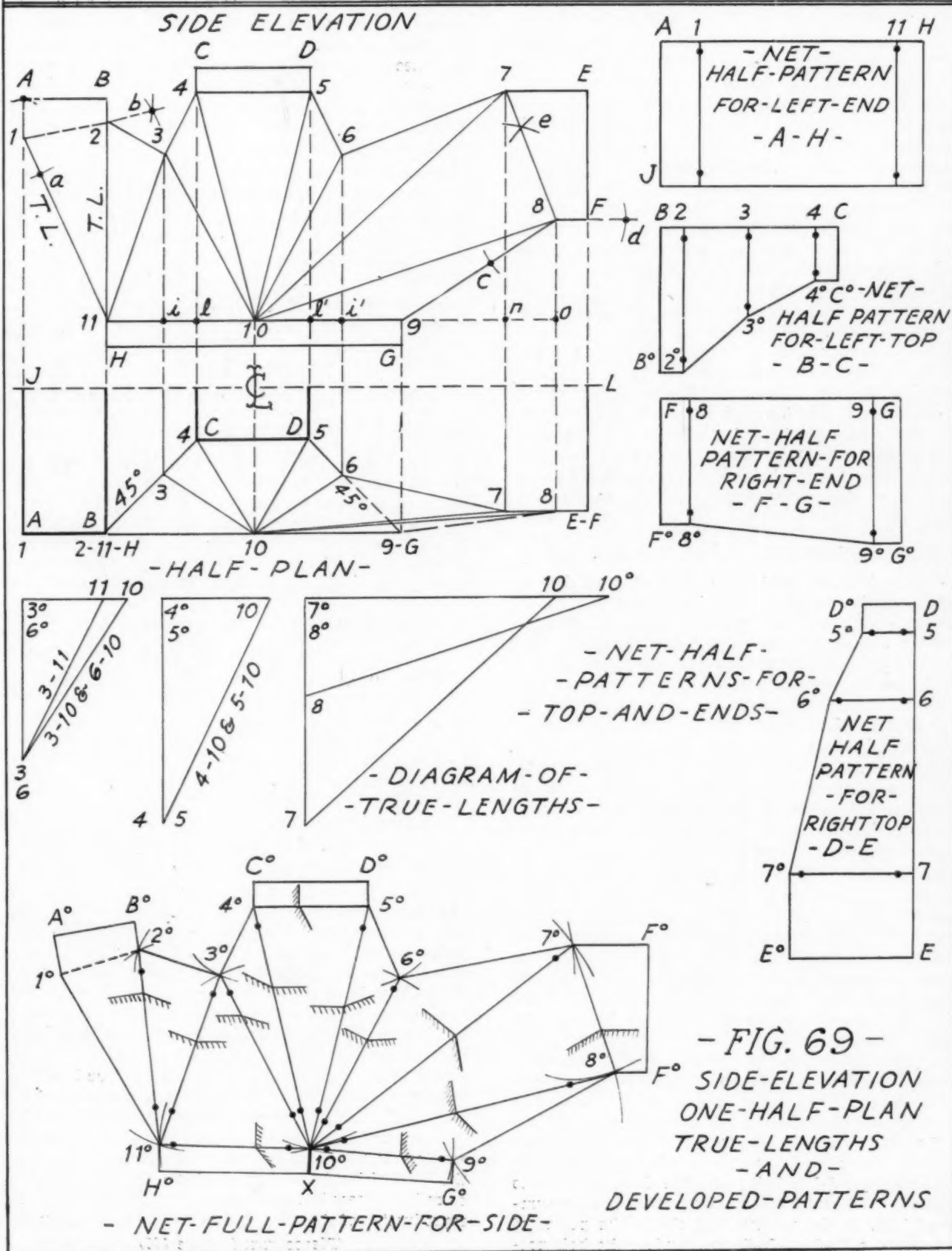
been introduced. If we use 15 inches as a radius with A in the left branch as a center and strike an arc as shown, the loss in area will be as much as the space between the two arrows. Using b in the right branch as a center with a 20 inch radius stroke an arc as shown. The distance between the two arrows in the right branch will indicate the loss in area. This loss in area can be overcome by bisecting the angles at C and b, so as to find the miter lines, as will be explained in connection with Fig. 69, which shows the side elevation, one half plan, true lengths and the various developed patterns. This side elevation has not been drawn to scale to suit the dimensions given in Fig. 68. The principles explained in connection with Fig. 69 are applicable to any size fitting regardless what the dimensions of the ducts may be.

Drafting the Side Elevation and Half Plan

Draw the side elevation according to given dimensions and heights. Number the collars from A to H and the angles from 1 to 11 all as shown. To avoid choking the left branch and have a full area equal to the dimension of the left duct A-B, use 1 as a center and

* All Rights Reserved.

NET PATTERNS FOR DISSIMILAR TRIPLE BRANCHES CONNECTING TO SQUARE DUCT HAVING SIMILAR AREA



- FIG. 69 -
SIDE-ELEVATION
ONE-HALF-PLAN
TRUE-LENGTHS
- AND -
DEVELOPED-PATTERNS

with any desired radius draw arcs intersecting the angle *A-1-11* at *A* and *a*. Using *A* and *a* as centers with any desired radius intersect arcs at *b*. Draw the miter line *1-b*. Now draw the horizontal line *A-B* to the desired dimension and draw the perpendicular line *B-2* to intersect the miter line at *2* and connect *2* to *3*.

In a similar manner to avoid loss of area in the right branch, use *8* as a center with any desired radius, describe arcs cutting the angle *F-8-9* at *C* and *d*. Using *C* and *d* as centers with the same or any other radius intersect arcs at *e*. Draw the miter line from *8* through *e* indefinitely as shown. From *F* erect the perpendicular line *F-E* equal to the desired dimension and from *E* draw the horizontal line *E-7* to intersect the miter line *8-7* at *7*. Draw lines from *7* to *6* and *10*. The above rules prevent the choking of the branches between the miter lines *1-2* and *7-8*, which would occur if no miter lines were used as explained in connection with the left and right branches in Fig. 68. In its proper relative position below the elevation in Fig. 69 draw the one half plan, being careful that each angle in elevation is in its correct relative position in the half plan, all as indicated by the dotted lines and similar letters and numbers in both half plan and side elevation. Note that from the corners *9* and *11* in the half plan lines have been drawn at 45 deg. angles to meet perpendicular lines drawn from *3* and *6* in elevation at *3* and *6* in the half plan. From points *3* and *6* draw lines to *4* and *5* respectively in both elevation and half plan.

Developing Patterns for Top and Ends of Fittings

For the half net pattern for the left end *A-H* in elevation, take the girth from *A* to *H* and set it off on the horizontal line *A-H* at the upper right. From *A* draw the perpendicular line *A-J* equal to *A-J* in half plan and complete the rectangle shown in the pattern. To develop the net half pattern for the right end *F-G* in elevation, take this girth and set it off on the line *F-G* at the right. From points *F-8-9* and *G* draw perpendicular lines indefinitely. Now measuring from the center line *J-L* in half plan take the projections to similar numbers *F-8-9* and *G* and set them off on corresponding numbered lines in the pattern, measuring from the line *F-G*, thus obtaining intersections *F⁰-8⁰-9⁰* and *G⁰* to complete the desired pattern.

For the net half pattern for the left top *B-C* in elevation take the girth of *B-2-3-4-C* and set it off on the horizontal line at the right as indicated by similar letters and numbers. From these points at right angles to *B-C* draw perpendicular lines indefinitely as shown. Again measuring from the center line *J-L* in half plan take the projections to similar numbers *B-2-3-4-C* and set them off on similar numbered lines in the pattern measuring from the line *B-C* and in this manner obtain the intersections *B⁰-2⁰-3⁰-4⁰-C⁰* which completes the desired pattern. The net half pattern for the right top *D-E* in elevation is obtained by taking this girth *D-5-6-7-E* and setting it off on the vertical line *D-E* at the lower right as shown, and from these points horizontal lines are drawn indefinitely. Measuring from the center line *J-L* in half plan, take the projections to points *D-5-6-7* and *E* and set them off on similar numbered lines in the pattern and obtain the points of intersections *D⁰-5⁰-6⁰-7⁰-E⁰* to complete the half pat-

tern shape. It should be understood that the full patterns have been omitted for want of space.

Finding the True Lengths for Side Pattern

Below the plan is shown the diagram of true lengths required for developing the side pattern by triangulation. The angle lines shown in the half plan represent the bases of triangles to be constructed whose various altitudes are indicated by the vertical heights in elevation having similar numbers. Note that the base lines *10-3* and *10-6* in the half plan are of similar length also the base lines *10-4* and *10-5*.

To obtain the true length of the base line *3-11* in the half plan, set off this distance as shown by *3⁰-11* in the diagram. Now take the vertical height from *i* to *3* in elevation and set it off on the perpendicular line from *3⁰* to *3* and draw a line from *11* to *3* the true length of *3-11* in either plan or elevation.

As the base lines *10-3* and *10-6* in the half plan are similar set off this distance as shown by *3⁰-10* and *6⁰-10* in the diagram. As the vertical heights *i-3* and *i-6* in elevation are both the same, set off this height in the diagram as indicated from *3⁰* to *6⁰* and draw a

line from *3⁰* to *10* which represents the true length of the line *3-10* or *6-10* in either plan or elevation. In this manner all of the true lengths are found, always obtaining the base measurement of the triangle from the half plan and its vertical height from the elevation. By using the dividers and comparing the numbers in the diagrams with those in either half plan and elevation the procedure can be easily followed.

Developing the Full Net Pattern for Side

To save space and avoid a number of separate patterns a full side layout has been developed in one piece. In practice this can be divided into sectional parts to suit the size of the metal sheet used. The pattern can be developed by starting in the center and working right and left. To start, take the distance of *4-5* in either half plan or elevation and set it off as shown by *4⁰-5⁰* in the side pattern below.

Now with a radius equal to *4-10* and *5-10* in the true lengths using *4⁰* and *5⁰* in the side pattern as centers intersect arcs at *10⁰* and draw lines from *10⁰* to *4⁰* and *5⁰*.

With a radius equal to *4⁰-3⁰* in the half pattern for left top, and using *4⁰* in the side pattern as radius describe a short arc near *3⁰* and intersect it by an arc struck from *10⁰* as center with a radius equal to *10-3* in the true lengths. Draw lines from *4⁰* to *3⁰* to *10⁰*. Now using *10-11* in either plan or elevation as radius and *10⁰* in the side pattern as center describe an arc near *11⁰* and intersect it by an arc struck from *3⁰* as center with a radius equal to *3-11* in the true lengths. Draw lines from *3⁰* to *10⁰* to *11⁰*. With a radius equal to *3⁰-2⁰* in the half pattern for left top and with *3⁰* in the side pattern as a center describe a short arc near *2⁰* and intersect it by an arc struck from *11⁰* as center and the vertical height *11-2* in elevation (its true length) as radius. Draw lines from *3⁰* to *2⁰* to *11⁰*. Now take a reproduction of *A-1-11-2-B-A* in elevation and connect

(Please turn to page 156)

Ductwork Estimating Tables

By E. B. Root
Jackson & Church Co.
Saginaw, Mich.

THE success of a mechanical warm air heating system depends to a large extent upon the design of the duct system. I recommend the revised Technical Code (Manual 9).

"With this thought in mind I wish to call attention to the charts illustrating reducing or "Y" Joints with various sized branches. It will be noted that the large end of the Y joint is indicated by dimension "A", the small end by dimension "B". The amount that the trunk line is reduced by the taking off of a branch (dimension "D") is indicated as A-B. According to these charts where dimension "D" is 4x7, dimension A-B will be 2 inches, 5x7—3 inches, 6x7—4 inches, etc., up to 16x7 which will reduce the trunk line 12 to 13 inches. (See last 2 columns in Table for Reducing Joint With One Branch.)

"These values were obtained by designing the system on a static pressure of .08 inch water gauge per 100 feet.

"It will be noted that Stack No. 1 is the last supply on the trunk line and requires 7x7 duct. Stack No. 2 requires a 4x7 and adds 2 inches to the main duct. The branch trunk line requires a 16x7 duct and adds 13 inches to the trunk line. Stack No. 3 requires an 11x7 duct and adds 8 inches to the main trunk line.

"If the system is designed strictly according to code, it is necessary to correct the diameter of round pipes of unequal equivalent lengths in order that any and all pipes, regardless of their equivalent lengths, will handle any required cfm at the same predetermined static pressure. This is accomplished by following procedure as outlined in the revised Technical Code (Manual 9).

"On the larger jobs, these corrections will of necessity change the amount a trunk line will be reduced by a given size branch. Since these charts were designed for the purpose of determining the weight of material and time required for fabrication of ducts from field measurements, the cost of time and material would not be affected by the slight changes resulting from the use of the revised Technical Code, Manual 9."

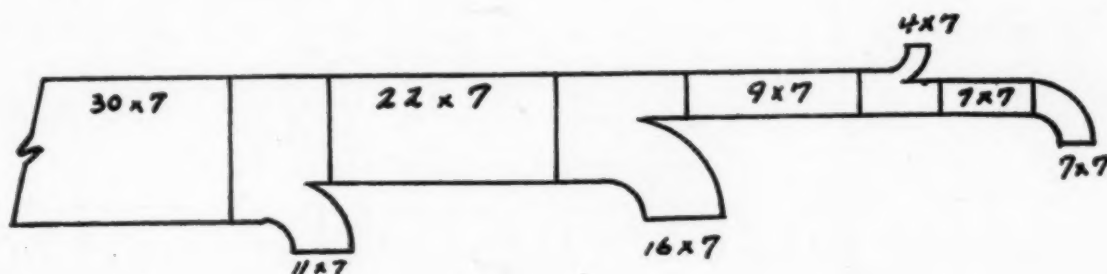
Example:

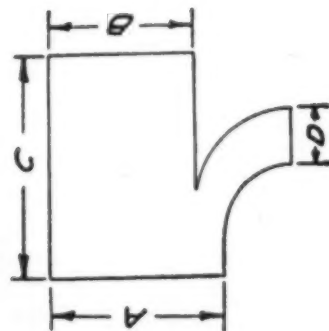
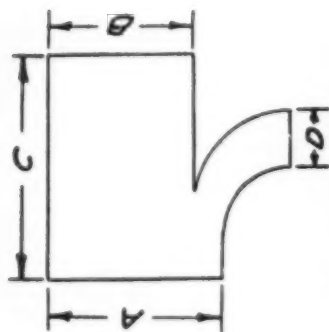
It is desired to handle 1000 cfm through a duct at .08 SP with four branches handling the following volumes of air in the order mentioned.

Stack No. 1	150 cfm
Stack No. 2	80 cfm
Branch Trunk	470 cfm
Stack No. 3	300 cfm
Total	1000 cfm

"The schedule of duct sizes would be as follows:

Stack No.	Branch Trunk cfm	Main Trunk	Rd. Pipe Before Corr.	Corr. Factor	Rd. Pipe Corr.	Rect. Equiv.
1		150	7.5			7x7
2		80	5.9			4x7
		230	8.8			9x7
4	150					
5	125					
		275				
6	90					
		365				
7	105					
		470	11.5			16x7
		700	13.2			22x7
3	300		9.7			11x7
		1000	15.2			30x7



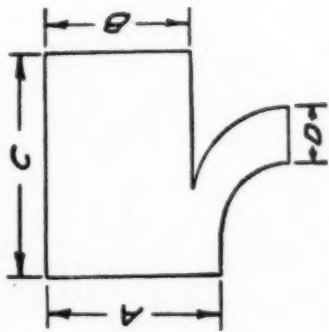
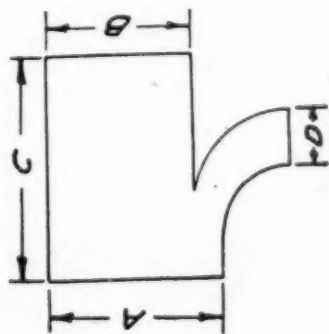


REDUCING JOINT WITH ONE BRANCH

DEPTH OF DUCT 8"									
C	27"		24"		21"		18"		17"
	D	A-B (12")	D	A-B (10")	D	A-B (8")	D	A-B (7")	
A	16x8	Weight	Time	Weight	Time	Weight	Time	Weight	Time
	44x8	28.4	90'	25.5	90'	22.3	90'	20.0	90'
	42x8	27.5	90'	24.7	90'	21.6	90'	19.5	90'
	40x8	26.6	90'	23.9	90'	20.9	90'	18.9	90'
	38x8	25.7	90'	23.1	90'	20.2	90'	18.3	90'
	36x8	24.8	90'	22.3	90'	19.5	90'	17.7	90'
	34x8	23.9	75'	21.5	75'	18.8	75'	16.1	75'
	32x8	17.9	75'	16.0	75'	14.0	75'	12.7	75'
	30x8	17.2	60'	15.4	60'	13.5	60'	12.2	60'
	28x8	16.5	60'	14.8	60'	12.9	60'	11.8	60'
	26x8	15.8	60'	14.2	60'	12.4	60'	11.3	60'
	24x8	15.1	45'	13.6	45'	11.9	45'	10.8	45'
	22x8	14.4	45'	13.0	45'	11.3	45'	10.4	45'
	20x8	13.7	45'	12.3	45'	10.8	45'	10.0	45'
	18x8	13.0	45'	11.7	45'	10.3	45'	9.5	45'
	16x8	11.1	45'	11.1	45'	9.7	45'	9.0	45'
14x8	9.2	45'	9.2	45'	9.2	45'	8.5	45'	
12x8	8.1	30'	8.1	30'	8.1	30'	8.1	30'	
10x8	7.0	30'	7.0	30'	7.0	30'	7.0	30'	
9x8	6.3	30'	6.3	30'	6.3	30'	6.3	30'	
8x8	5.8	30'	5.8	30'	5.8	30'	5.8	30'	
7x8	5.6	30'	5.6	30'	5.6	30'	5.6	30'	
6x8	5.5	30'	5.5	30'	5.5	30'	5.5	30'	

REDUCING JOINT WITH ONE BRANCH

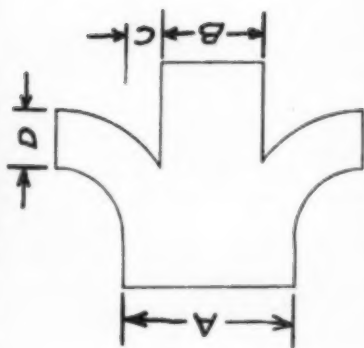
DEPTH OF DUCT 9"										
C	27"		24"		21"		18"		17"	
	D	A-B (10")	D	A-B (9")	D	A-B (7")	D	A-B (6")	D	A-B D A-B
A	14x9	Weight	Time	12x9	Weight	Time	10x9	Weight	Time	8x9-5" 7x9-4" 5x9-3" 4x9-2"
	44x9	29.4	90'	26.3	90'	90'	23.4	20.0	90'	19.0
	42x9	28.5	90'	25.5	90'	90'	22.7	19.4	90'	18.6
	40x9	27.6	90'	24.7	90'	90'	22.0	18.8	90'	18.0
	38x9	26.7	90'	23.9	90'	90'	21.3	18.2	90'	17.4
	36x9	25.8	90'	23.1	90'	90'	20.6	17.6	90'	16.8
	34x9	24.9	75'	22.3	75'	75'	19.9	17.0	75'	16.2
	32x9	18.6	75'	16.7	75'	75'	14.9	16.4	75'	12.1
	30x9	17.9	60'	16.0	60'	60'	14.4	12.7	60'	11.7
	28x9	17.2	60'	15.4	60'	60'	13.8	12.3	60'	11.2
	26x9	16.5	60'	14.8	60'	60'	13.3	11.8	60'	11.8
	24x9	15.8	45'	14.2	45'	45'	12.7	11.3	45'	11.3
	22x9	15.1	45'	13.6	45'	45'	12.2	10.9	45'	10.9
	20x9	14.4	45'	12.9	45'	45'	11.6	10.4	45'	10.4
	18x9	13.7	45'	12.3	45'	45'	11.1	9.9	45'	10.0
	16x9	13.0	45'	11.7	45'	45'	10.5	9.4	45'	9.5
14x9	11.0	30'	11.0	30'	30'	10.0	8.9	30'	9.1	
12x9	9.4	30'	9.4	30'	30'	9.4	8.5	30'	8.6	
10x9	8.0	30'	8.0	30'	30'	8.0	8.0	30'	8.2	
9x9	7.7	30'	7.7	30'	30'	7.7	7.7	30'	7.9	
8x9	7.5	30'	7.5	30'	30'	7.5	7.5	30'	7.7	
7x9	7.3	30'	7.3	30'	30'	7.3	7.3	30'	7.5	
6x9	7.3	30'	7.3	30'	30'	7.3	7.3	30'	7.3	



REDUCING JOINT WITH ONE BRANCH

REDUCING JOINT WITH ONE BRANCH

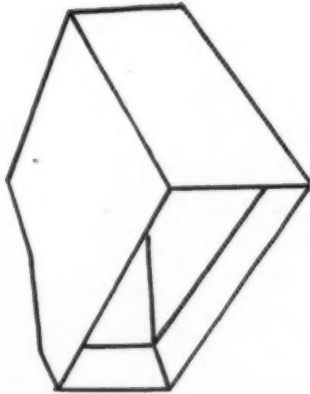
REDUCING JOINT WITH ONE BRANCH										REDUCING JOINT WITH ONE BRANCH									
DEPTH OF DUCT 10"										DEPTH OF DUCT 12"									
C	27"		24"		21"		18"		17"		C	27"		24"		21"		18"	
A	D	A-B	D	A-B	D	A-B	D	A-B	D A-B	D A-B	A	D	A-B	D	A-B	D	A-B	D A-B	D A-B
	Weight	Time	Weight	Time	Weight	Time	Weight	Time	Weight	Time		Weight	Time	Weight	Time	Weight	Time	Weight	Time
44x10	30.0	90'	26.1	90'	23.2	90'	20.2	90'	19.0	90'	44x12	30.6	90'	27.8	90'	24.4	90'	21.6	90'
42x10	29.1	90'	25.3	90'	22.5	90'	19.6	90'	18.5	90'	42x12	29.7	90'	27.0	90'	23.7	90'	21.0	90'
40x10	28.2	90'	24.5	90'	21.8	90'	19.0	90'	17.9	90'	40x12	28.8	90'	26.2	90'	23.0	90'	20.4	90'
38x10	27.3	90'	23.7	90'	21.1	90'	18.4	90'	17.3	90'	38x12	27.9	90'	25.4	90'	22.3	90'	19.8	90'
36x10	26.4	90'	22.9	90'	20.4	90'	17.8	90'	16.7	90'	36x12	27.0	90'	24.6	90'	21.6	90'	19.2	90'
34x10	25.5	75'	21.1	75'	19.7	75'	17.2	75'	16.2	75'	34x12	26.1	75'	23.8	75'	20.9	75'	18.6	75'
32x10	18.5	75'	15.8	75'	14.7	75'	12.9	75'	12.2	75'	32x12	19.8	75'	17.7	75'	20.2	75'	13.9	75'
30x10	17.7	60'	15.1	60'	14.2	60'	12.4	60'	11.8	60'	30x12	19.1	60'	17.1	60'	15.6	60'	13.5	60'
28x10	16.9	60'	14.4	60'	13.6	60'	11.9	60'	11.3	60'	28x12	18.4	60'	16.5	60'	15.1	60'	13.0	60'
26x10	16.2	60'	13.7	60'	13.0	60'	11.5	60'	10.9	60'	26x12	17.7	60'	15.9	60'	14.5	60'	12.5	60'
24x10	15.5	45'	13.0	45'	12.5	45'	11.0	45'	10.4	45'	24x12	17.0	45'	15.3	45'	14.0	45'	12.0	45'
22x10	14.8	45'	12.3	45'	12.0	45'	10.5	45'	10.0	45'	22x12	16.3	45'	14.6	45'	13.4	45'	11.6	45'
20x10	14.0	45'	11.6	45'	11.5	45'	10.0	45'	9.6	45'	20x12	15.6	45'	14.0	45'	12.9	45'	11.1	45'
18x10	13.7	45'	10.7	45'	10.9	45'	9.6	45'	9.1	45'	18x12	14.9	45'	13.4	45'	12.3	45'	10.7	45'
16x10	13.0	45'	10.6	45'	10.4	45'	9.1	45'	8.7	45'	16x12	14.2	45'	12.8	45'	11.8	45'	10.3	45'
14x10	12.2	45'	10.0	45'	9.9	45'	8.7	45'	8.2	45'	14x12	13.5	30'	12.2	30'	11.2	30'	9.8	30'
12x10					9.3	30'	8.2	30'	7.8	30'	12x12	12.8	30'	11.5	30'	10.7	30'	9.4	30'
10x10							7.7		7.3	30'	10x12			10.9		10.1		9.0	
9x10									6.9	30'	9x12					9.9		8.8	
8x10									6.5	30'	8x12							8.3	
7x10									6.0	30'	7x12							7.3	
6x10									5.6	30'								6.5	



To determine the weight and time of a rectangular reducing joint with two branches opposite, add to the time of a reducing joint with one branch according to following table:

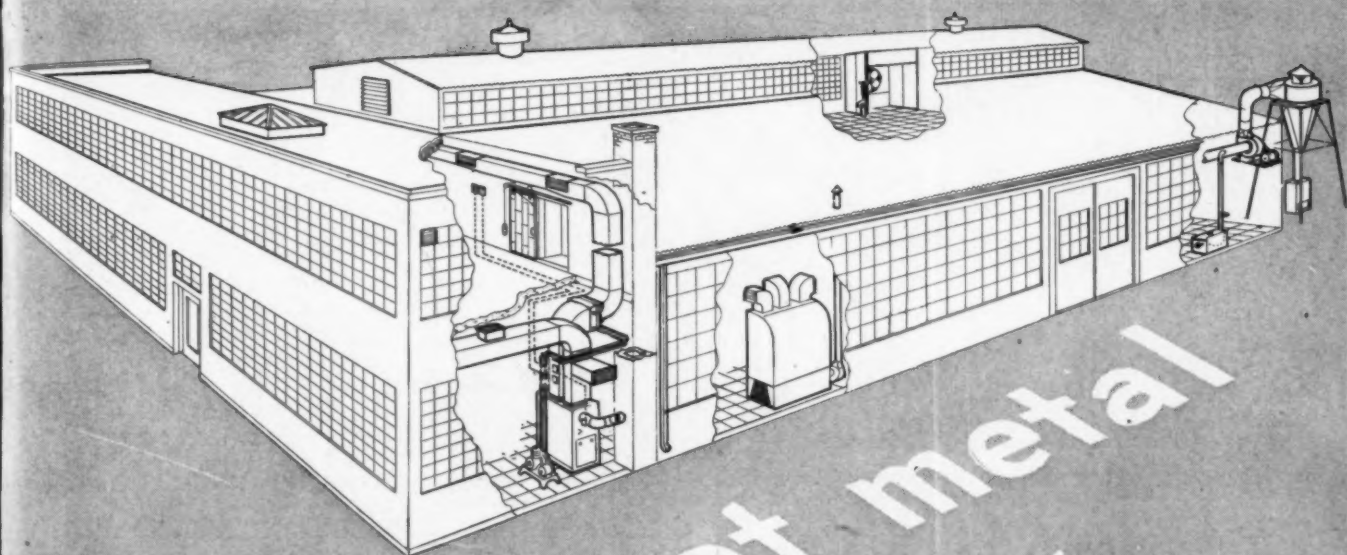
DEPTH OF DUCT

D	E	7"		8"		9"		10"		12"	
		Weight	Time	Weight	Time	Weight	Time	Weight	Time	Weight	Time
16	12"	11.0	30'	11.3	30'						
14	10"	9.0	30'	9.4	30'	10.5	30'				
12	9"					9.2	30'	9.7	30'		
12	8"	7.3	30'	7.5	30'			9.0	30'		
12	7"										
10	7"	6.3	30'	6.6	30'	7.4	30'				
10	6"							7.3	30'	8.4	30'
9	6"	5.8	30'	6.1	30'	6.5	30'				
9	5"							6.3	30'	7.8	30'
8	5"	5.5	30'	5.6	30'	5.8	30'				
8	4"							5.8	30'	7.0	30'
7	4"	5.0	30'	5.3	30'	5.5	30'	5.6	30'	6.3	30'
6	4"	5.0	30'	5.3	30'	5.5	30'				
6	3"							5.6	30'	6.3	30'
5	3"	4.7	30'	5.0	30'	5.1	30'				
5	2"							5.0	30'	5.7	30'
4	2"	4.4	30'	4.7	30'	4.9	30'	5.0	30'	5.5	30'
3	1"									5.5	30'



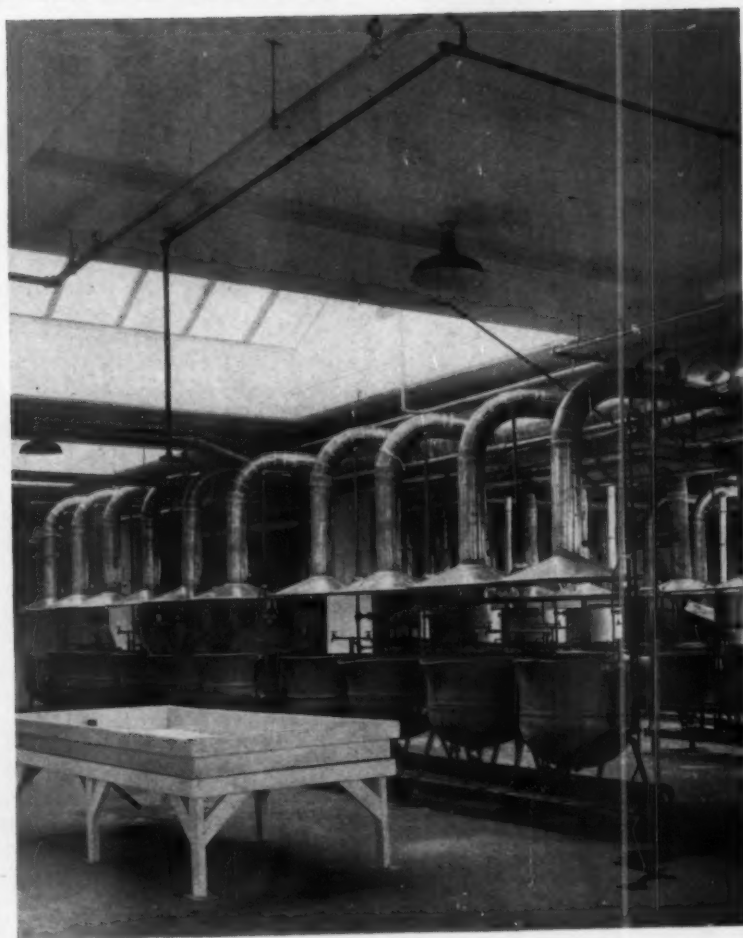
WEIGHT AND TIME FOR RECTANGULAR REDUCING JOINTS—NO BRANCH

		7"		8"		9"		10"		12"	
		Weight	Time	Weight	Time	Weight	Time	Weight	Time	Weight	Time
44		20.8	30'	21.2	30'	21.8	30'	22.0	30'	22.7	30'
42		20.0	30'	20.4	30'	20.9	30'	21.2	30'	22.0	30'
40		19.3	30'	19.6	30'	20.1	30'	20.4	30'	21.2	30'
38		18.5	30'	18.9	30'	19.3	30'	19.7	30'	20.4	30'
36		17.7	30'	18.4	30'	18.5	30'	18.9	30'	19.7	30'
34		16.7	30'	17.3	30'	17.7	30'	18.1	30'	18.9	30'
32		12.6	30'	13.0	30'	13.3	30'	13.6	30'	14.2	30'
30		12.1	30'	12.4	30'	12.7	30'	13.0	30'	13.6	30'
28		11.5	30'	11.8	30'	12.1	30'	12.4	30'	13.0	30'
26		10.9	30'	11.2	30'	11.5	30'	11.8	30'	12.4	30'
24		10.3	30'	10.6	30'	10.9	30'	11.2	30'	11.8	30'
22		9.7	30'	10.0	30'	10.3	30'	10.6	30'	11.2	30'
20		9.1	30'	9.4	30'	9.7	30'	10.0	30'	10.6	30'
18		8.5	30'	8.8	30'	9.1	30'	9.4	30'	10.0	30'
16		7.9	30'	8.2	30'	8.5	30'	8.8	30'	9.4	30'
14		7.2	30'	7.6	30'	7.9	30'	8.2	30'	8.8	30'
12		6.6	30'	7.0	30'	7.3	30'	7.6	30'	8.2	30'
10		6.0	30'	6.4	30'	6.6	30'	6.9	30'	7.6	30'
9		5.7	20'	6.1	20'	6.3	20'	6.6	20'	7.2	20'
8		5.4	20'	5.8	20'	6.0	20'	6.3	20'	6.9	20'
7		5.1	20'	5.5	20'	5.7	20'	6.0	20'	6.6	20'
6		4.8	20'	5.2	20'	5.4	20'	5.7	20'	6.3	20'

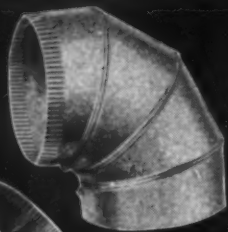


sheet metal *Section*

DEVOTED TO SHEET METAL CONTRACTING AND FABRICATING



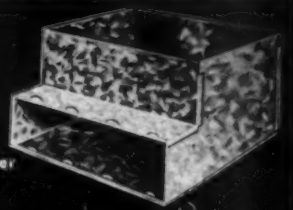
90° Adjustable Elbow



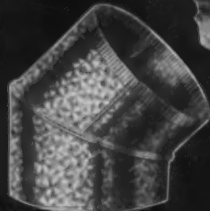
Airflo Tee-Joint



Funnel Floor Pan



Register Pan

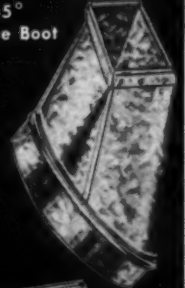


45° Adjustable 2-Piece Angle

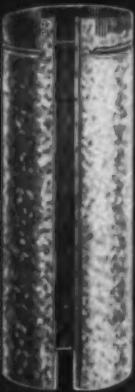


End Boot

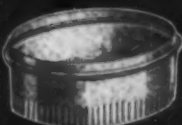
45° Angle Boot



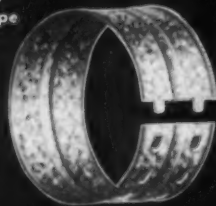
45° Angle



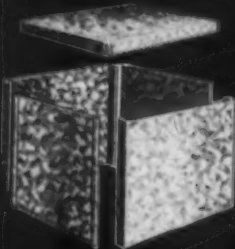
Galvanized LockJoint Furnace Pipe



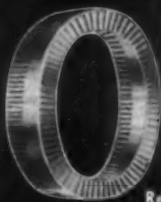
Casing Collar for Straight Hood



Adjustable Flue Thimble



Plenum Chamber



Reducing Collar

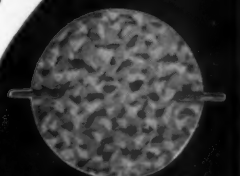
**Cut down
"Roughing-in"
time... and get finished jobs
that are good-looking,
satisfactory, safe . . .
with easy-to-handle
MILCOR Heating Products**

★ Furnace Pipe and Fittings

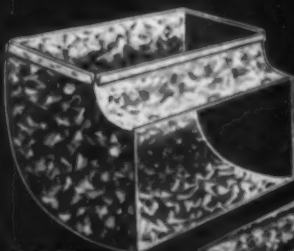
★ Forced Air Pipe and Fittings

★ Gravity Heating Fittings and Accessories

*Write for your free copy
of Catalog 401.*

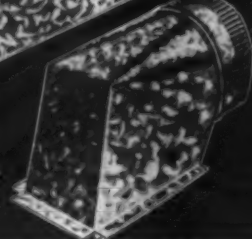


Round Volume Damper



90° Elbow

90° Top Takeoff



Milcor Steel Company

Inland Steel Products

MILWAUKEE 1, WISCONSIN

BALTIMORE 24, MARYLAND

BUFFALO 11, NEW YORK

CHICAGO 9, ILLINOIS

CINCINNATI 25, OHIO

CLEVELAND 14, OHIO

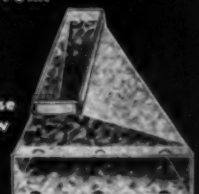
DETROIT 2, MICHIGAN

KANSAS CITY 8, MISSOURI

ROCHESTER 9, NEW YORK



Honeywell Register



Reverse Elbow

C-138



Unusual Sheet Metal Work— A Specialty

By Walter Rudolph
Erie, Penn.

In the sheet metal fabrication industry there seems to be a trend toward ever more efficient utilization of both men and equipment. This article tells of a contractor who demands varied skills of the men he employs and provides all the equipment they would be likely to need in exercising those skills.

VERSATILITY has long been the keynote at the Trost Sheet Metal Works in Erie, Penn., and for that reason the company has often been able to perform jobs that might stump some contractors. The accounts that this firm handles range from a few hundred dollars up into the thousands and the natural result of such a spread in types of accounts is work of a great diversity. Louis C. Trost organized his sheet metal shop 22 years ago and has always maintained a slogan of "we tackle anything and everything." This has led to the growth of the firm to a point at which it employs 17 expert sheet metal men and has a shop encompassing 5,000 square feet of floor area.

Some Jobs Handled

One example of a special job was the rig constructed

of angle iron frame and sheet metal for a cast to hold the victim of an auto accident. They got a call from a doctor, listened to his ideas about hingeing the rig here and there, and put it together.

Another special problem satisfactorily solved that brought large numbers of repeat orders was the design of a sheet metal "hump," as it is called, to hold non-electric magnets that draw scrap metal from many kinds of materials (Fig. 1). These "humps" were to be made in standard sizes, but still it turned out to be custom sheet metal work, because many of them had special adapters, etc. Therefore all of them were "on order" before production started.

As Trost produces these jobs, one man handles it from beginning to end, such an assignment naturally calling for an all-around mechanic. They are made of

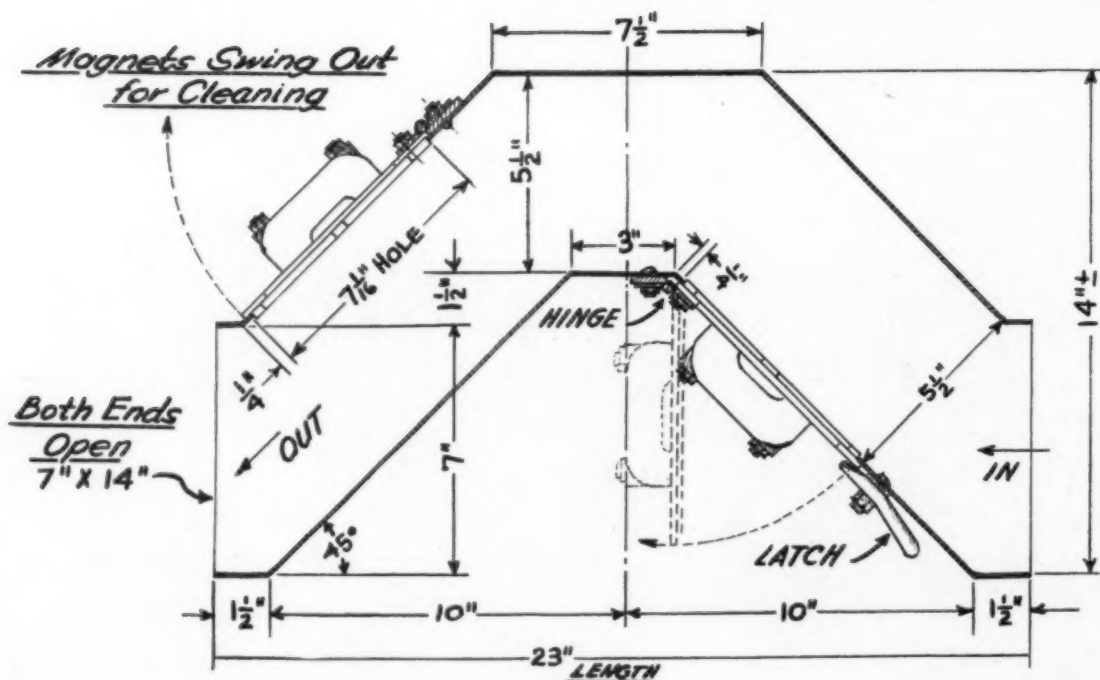


Fig. 1. The drawing shows one of the standard designs for the "humps" used to collect magnetic material in a material-conveying pipe. Variations from the above design are usually in dimensions.

10 gauge, hot rolled stainless steel and from 14 to 20 are finished weekly, of different sizes.

Application of this product is interesting; a "hump" is fitted into a 12-inch pipe carrying grain, plastic material, rags or wool—depending upon the industry wherein it is being used—and has rectangular openings on each end. As shown in the illustration it has a V-shape and magnets fit into openings on each bank of the V.

Most of the "humps" conform to certain standard sizes, already in use. However if there are deviations from the more or less standard model of a certain size, the shop gets a print with the job. The mechanic takes the print and lays out his pieces on a sheet. Then he shears the top, bottom and sides.

Effective Welding Process

He follows the job on thru by forming the tops and bottoms, and then taking his work next to the welding department where he probably welds it, too. A special rod is used for this kind of work, known to some in the trade, called Edevor, Alco No. 92, which is used with a carbon arc instead of in a holder. It is laid on a joint and the carbon is used to melt the parent metals and the rod, or join the side and bottom.

The advantage claimed for this type of welding is that because it can be done at comparatively low heat, metal distortion is eliminated and the galvanized coating of the sheet metal is not burned off—the tin rod coating gives a weather coating to the weld. A war development, this rod is not used extensively as yet, and is more expensive than other kinds, running about \$1.10 a pound.

Trost Sheet Metal also does a large amount of stainless steel lettering work for signs (Fig. 2 and 3). Rib-

bons, bands and fastening plates are soldered by hand and are fastened to sign boards by button clips, which permits interchangeability, a feature popular with theatres.

Knowing air capacity and relative matters this firm's craftsmen are able to do jobs such as building hoods over ranges, acid baths, dust producing machinery and so forth. This increases the amount of work such a shop can handle. A crew may work in a slaughter house, a restaurant kitchen and a rubber factory in one day.

Exhaust Installations

For example, in a rubber factory there was a problem of removal of soapstone dust and collection for reuse. Two cyclone blowers were installed to maintain a capacity removal power regardless of whether the piping was 28" or 3 1/2" in diameter, exhausting the various machines. In other words the system was graduated along the machinery, but retained the same drawing power at every work station.

In another similar application of the same principles, four hoods were installed over machinery where exhaust steam had to be removed instantly at one step in a production process. The system was graduated, but each hood did a capacity job.

"I believe in employing master mechanics in a jobbing shop because this gives us maximum production on a great variety of jobs without resorting to 'production' or monotonous work," said Trost. "We have three college graduates, each of whom could teach metal working. We take other men and start them at layout and follow right through in every other department of the plant, winding up with an employee that can go practically anywhere and do any job."

Fig. 2. On the right Mr. Trost is shown inspecting a job on which his stainless steel letters had been used, with very effective results. In the remodeling of fronts of stores as well as restaurants the use of stainless steel for letters and other decorative effects has been steadily growing in popularity.



Fig. 3. To the left is seen a view of one of the men in the Trost shop at work on some stainless steel letters. It is a little surprising, even to the contractor, how popular these letters have become. Ribbons, bands and fastening plates are soldered by hand and the letters are fastened to sign boards by button clips. This achieves interchangeability making them useful to theatres.



Fig. 4. This is the welded stock rack that is mentioned in the text and provides the shop with virtually visual inventory.

This shop handles a lot of custom shearing along with its fabrication work. The reason behind this is that a factory's metal working equipment is used too often on heavy steel work to fit it for fine stainless steel shearing. It is not uncommon for the firm to have \$25,000 worth of stainless steel pieces on the floor at once, for shearing and/or forming.

Shop Equipment

A list of the equipment that is used in this shop includes: Unishears, taking up to $\frac{1}{8}$ " plate; U. S. electric tool surface grinder; Lockformer; Whitney and Jensen 10-foot forming brake; Niagara 8-foot foot-power shears; 6-foot power roll, plant-contrived, that takes up to $\frac{3}{16}$ " stock; 4-foot heavy duty roller; 4-foot box and pan brake, capacity of $\frac{1}{8}$ " plate; (latter two Keene and Cincinnati, respectively;) three Lincoln electric welding machines, of 200, 250 and 300 amps. capacity; Ace spot welder, $\frac{1}{4}$ " capacity, and 10-foot Niagara power shears. The shop also has Budgit and Yale hoists; angle iron shears and benders; angle ring roller, $2 \times 2 \times \frac{1}{4}$ " capacity, both Whitney, and a Builders drill press.

Equipment is located for comparatively easy material handling, with work flowing through the shop toward the rear where welding equipment is installed. Another feature designed for efficiency is the system in use for handling stock.



Fig. 5. Section of the welding department in this sheet metal shop—well-equipped with electric arc and resistance welders.

Stock Rack

It is a perpetual inventory system. A rack welded of $2 \times \frac{1}{4}$ " angles has a series of compartments designed to hold up to three tons each, with the whole rack capable of holding about three carloads of stock (Fig. 4). Compartments are about $40" \times 8"$ on an opening, and hold sheets up to ten feet in length. Along this length are supporting posts, spaced 20" apart. The rack is seven feet high.

At present each compartment is labeled in chalk as to the stock size it contains, but when the supply situation is more normal, it will be possible to stencil the designations. Handling of stock from this rack into the shop is simplified by the use of several plant-fabricated "jitneys" with 6-inch wheels that turn in all directions (Fig. 4). The "jitneys" are built to knee-level to save some bending over in handling.

Construction of this rack involved a lot of labor and cost, but in the opinion of the shop owner it has paid for itself over and over through simplification of stock-keeping and ease of inventory. He says he can tell at a glance, practically, where he stands on many different kinds of stock, and with the volume and variety of work handled, this is quite important.

At present the Trost shop is being remodeled in order to provide an attractive sales room, to enable better merchandising for the benefit of the casual customer who drops in because he happens to be passing.

Have You Got Problems?

Air them in "Open for Discussion" Some one else may have licked your problem before.

See Pages 85-86

Design of Waste Removal Systems (Part IV)

By H. M. Nichols
Industrial Dep't, Sturtevant Div.,
Westinghouse Electric Corp., Hyde Park, Mass.

These articles are adapted from a series of lectures that are presented in the Sales Engineering School of B. F. Sturtevant Co. Their application of basic principles is so sound as to be of value to any sheet metal contractor handling this type of work in any good volume.

COMMON practice in determining duct sizes is to make the branches the same size as the throat openings at the hoods, with the main ducts so sized that their areas at any point are between 20 and 25% greater than the sum of the areas of the hood connection served between the point in question and the dead ends of the mains. Sub mains and mains are sized so that at all points their areas are between 20 and 25% greater than the load area served. Since floor sweeps are used occasionally and for a few minutes at a time, they are not included in computing the load area or the sizes of the main ducts.

The mains and submains should preferably receive only one branch in a section of uniform area and in no case should they receive more than two branches in such sections. The discharge main is made the same size as the suction main and dust collections are usually applied at a nominal inlet velocity of 3200 feet per minute. On the usual grinding exhaust system having 20 to 25% oversize mains a dust collector may be chosen having the same nominal inlet dia. as the discharge main.

The fan must be of a type suitable for handling material through the wheel. Only straight radial blade fans with free unobstructed inlets should be used for handling air carrying materials such as dust, lint, sawdust, shavings, etc. Other types are only to be used when preceded by an effective filter.

Dust collectors are usually located out-of-doors, on the roof or some other place where a small quantity of dust discharge from the stack will not be objectionable. Do not locate a collector near open windows. If this cannot be avoided, provide the collector with a stack extending up above the level of the roof.

Where a higher degree of separation is required, or the cleaned air is to be returned to the building, then it is necessary to filter the air as no form of mechanical separation is sufficiently efficient for this service.

It is advisable to use a cyclone collector to remove the bulk of the dust and carry the exhaust from the stack of the cyclone to a cloth screen collector or filter. These are usually applied on the basis of around 3 cu. ft. of air per sq. foot of cloth area and having a resistance of about 2" of water under average operating conditions.

Duct work for exhaust systems is usually fabricated from galvanized iron, the gauges of which vary with the diameter of the duct and the suction at the fan. For low suction systems (up to 10 inches of water at the fan intake) the following gauges are recommended:

Small size ducts 22 gauge
Ducts 16" to 24" dia. 20 gauge
Ducts 25" to 34" dia. 18 gauge
Ducts above 34" dia. 16 gauge

Branch ducts should lead out of the hoods at the point where the materials to be conveyed are naturally directed by the operation of the apparatus.

All branches should join the main at an acute angle with the incline in the direction of the air flow. The junctions should be at the side or top and never at the bottom of the main. Neither should two branch connections be placed directly opposite each other. Branch ducts should not project into the main.

All permanent circular joints should be lap jointed, riveted, and soldered, and all longitudinal joints either grooved and locked or riveted and soldered. Circular laps should be in the direction of the air flow, and piping installed out-of-doors should have the longitudinal laps at the bottom.

Cleanout openings having suitable covers should be placed near the bottom of all risers and at other points in the mains and branches so that every part of the system can be easily reached in case the system clogs. Either a large cleanout door should be placed in the main suction pipe near the fan inlet or preferably a detachable section of duct held in place by lug bands

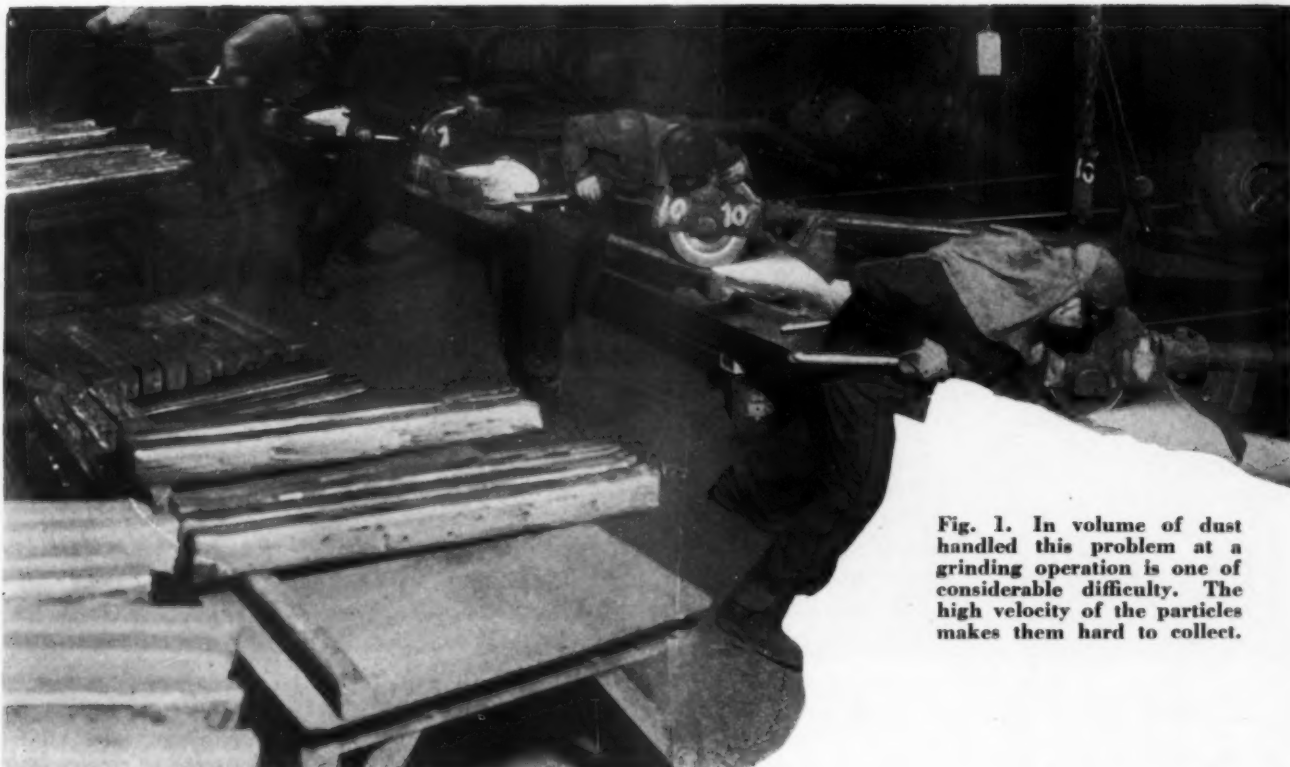


Fig. 1. In volume of dust handled this problem at a grinding operation is one of considerable difficulty. The high velocity of the particles makes them hard to collect.

should be provided. Tight fitting blast gates should be installed at each hood connection.

Increase in duct size should be made on a taper and not by an abrupt change in size. Branches should enter the main at or near the point where the size changes in order to avoid the possibility of an oversize section and too low an air velocity. All ducts should be smooth on the inside and free from projections or rough spots. No screens or other obstructions should be placed in the branches or main ducts with the exception that cones or other adjustable devices for equalizing the air flow may be placed in the branch ducts close to the points where the ducts join the exhaust hoods. Where such equalizing devices are used they should be of substantial construction securely fastened in place and should not have any projections on which material may catch. Equalizing devices should not be used where the materials conveyed are extremely abrasive.

The duct design should be checked to see that it complies with any state or insurance codes effective for the location and type of exhaust system under consideration. The more important codes to be considered are:

- (1) State codes covering the design and installation of exhaust systems, obtainable from state industrial or labor departments.
- (2) Fire underwriters regulation for the installation of blower and exhaust systems, published by the National Fire Protective Association, 60 Battery-march St., Boston, Mass.
- (3) Safety codes for the prevention of dust explosions published by the American Standards Association, 29 West 39th St., New York City.

Cyclone collectors are designed primarily for separating the conveyed material from the air stream. Suitable storage hoppers or means of continuously removing the separated material from the collector should be furnished. Under no circumstances should a cyclone collector or other type of separator be used as a storage hopper.

Machine hoods for the collection of coarse materials such as chips and particles from grinding wheels must be so shaped that the dispersed particles are thrown by the action of the wheel or cutter into the mouth of the hoods since these large particles are thrown off with such a high velocity and kinetic energy that their trajectories cannot be diverted by any reasonable air velocities.

The point of dust generation should be inclosed as much as operation of the machine will permit. Also the speed of the dust particles may be reduced and their direction changed so as to deflect them into the air stream by the proper location of baffles. Each process should be carefully studied and every possible step taken to inclose the dust source and direct the particles into the exhaust air stream.

Dust produced by grinding and snagging operations on large bulky castings is many times handled by down draft hoods placed beneath the floor with a grating above them which serves as a work station. Air is drawn over the work down through the grating into the exhaust hood. Successful down draft exhaust requires that the air velocity around the work be sufficient to remove the dust without creating objectionable drafts around the workmen's feet. A velocity of 200 feet per minute over the gross area of the grating is a good average value for this application. Where



Fig. 2. This is intended to give a clear picture of the effect of dust collecting equipment. When the collector is operating there is virtually no dust at all around the shake-out.

foundry shakeouts are handled by down draft use 250 velocity for cold castings, while if the castings are hot the tendency for the dust to rise will require around 400 foot velocity to control same.

Foundry shakeouts, grinding and similar operations may be handled in booths having one open end and exhaust from the opposite end. These operations require from 100 to 200 foot velocity over the open end of the booth.

Processes such as belt and bucket conveyors, screens and similar equipment are handled by the inward leakage principle. Source of dust is inclosed as completely as possible and sufficient air exhausted to

maintain air inward leakage at all openings, cracks, and crevices. Where it is possible to compute the area of the openings allow 150 foot velocity over the total area. Otherwise allow a liberal amount of air since it is surprising how much leakage area is involved in seemingly small cracks and crevices.

Sand blast rooms require the removal of a sufficient volume of air to reduce the dust content of the room to a reasonable level. Sand blast rooms are exhausted either by down draft or longitudinal movement of air. Recommended velocity is 70 feet per minute. Fresh air inlets are required opposite to the exhaust outlets.

Have Dividends Skyrocketed?

MUCH publicity has been given lately to the increased dividends that have been announced by some corporations. Some sources have attempted to interpret this as an indication that profits of industry are swollen completely out of line and that "profiteering" is widespread.

Let us analyze this viewpoint in the light of some actual figures on dividends in relation to wages. Dividends for 1947 may total \$6.6 billion, 17 per cent over 1946 but weekly factory pay is up 20 per cent in the same period. Dividends are now 70 per cent over 1939 as against more than 100 per cent for weekly wages. Going farther back, to 1929, we find that dividends have increased 15 per cent while wages have more than doubled.

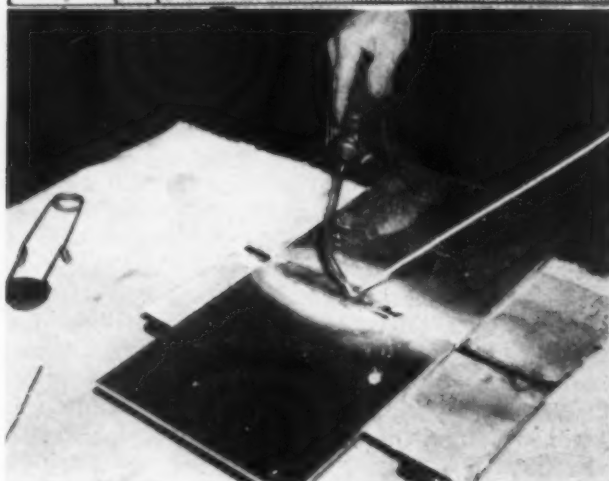
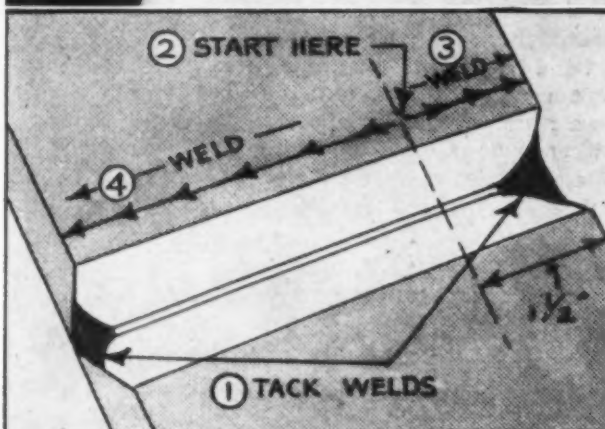
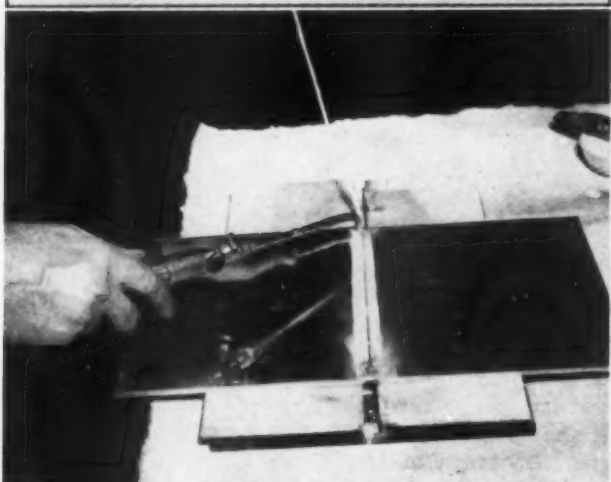
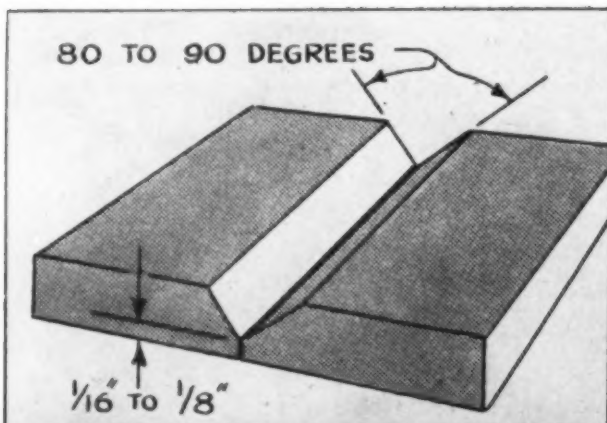
Current profits are actually largely 'paper profits' since the depreciation on plant and machinery, figured at prewar costs, would be totally inadequate to replace that equipment on today's market.

Economic Gains in the South

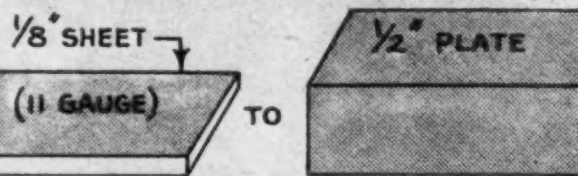
RECENT events have shown that the South is rapidly catching up to the economic standards of the rest of the country. In 1929 the income per person in the ten southeastern states was only half that of the national average, now it is almost three-fourths of the average.

Cotton is no longer able to lay claim to kingship in the economic picture in the south; once 35 per cent of southern farmland was devoted to that one crop but now only 15 per cent is in cotton. Food, feed and oil crops have taken the place of the 'King.'

Southern farmers and workers have had larger increases in income than those in other parts of the country. Coal, textile and lumber wages have out-gained autos and steel; peanuts, tobacco and cotton have increased more than milk and wheat prices. Southerners are still leaving the area and that, in turn, tends to tighten the labor supply and further inflate wage rates.



TIP SIZE · OXWELD NOS. 9 OR 12, OR
PUROX AND PREST-O-WELD NOS. 5 AND 6.



OXWELD NO. 14 ALUMINUM WELDING ROD

1/8" ROD FOR SHEET UP TO 3/8"

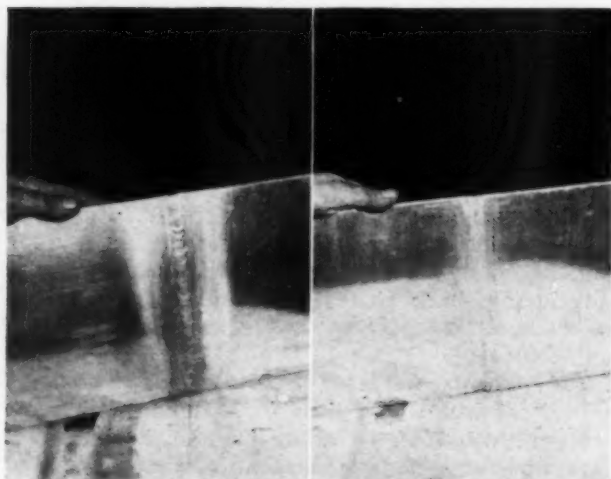
1/4" ROD FOR PLATE OVER 3/8"

Welding Aluminum In Heavy Gauges

Photo directly above is No. 1.
Others follow counterclockwise.

1. This sketch gives the rod and tip sizes for welding aluminum up to $\frac{1}{2}$ in. in thickness.
2. Edges should be beveled to form a single-vee joint with $\frac{1}{16}$ in. to $\frac{1}{8}$ in. shoulder. Then the sheets and rod should be cleaned and fluxed.
3. Sheets should be spaced $\frac{1}{8}$ in. at one end and $\frac{3}{8}$ in. apart at the other end and then tack-welded. Long seams are tack-welded every three or four inches with uniform spacing.
4. Plate over $\frac{1}{4}$ in. in thickness should be welded in two layers. Start $1\frac{1}{2}$ in. from one end, weld to that end, then complete first layer to opposite end.
5. The second layer should be made the same as the first. Starting the weld $1\frac{1}{2}$ in. from one end prevents cracking along the weld metal.
6. Observe that the weld is sound (left) and has good penetration (right). A double-vee joint is usually used for plate over $\frac{1}{2}$ in. in thickness.

Reprinted from Linde Tips.



Tools and Their Uses

A series dealing with the various tools that are used in and adapted to sheet metal work. The articles will discuss common uses as well as unusual applications that may not be familiar.

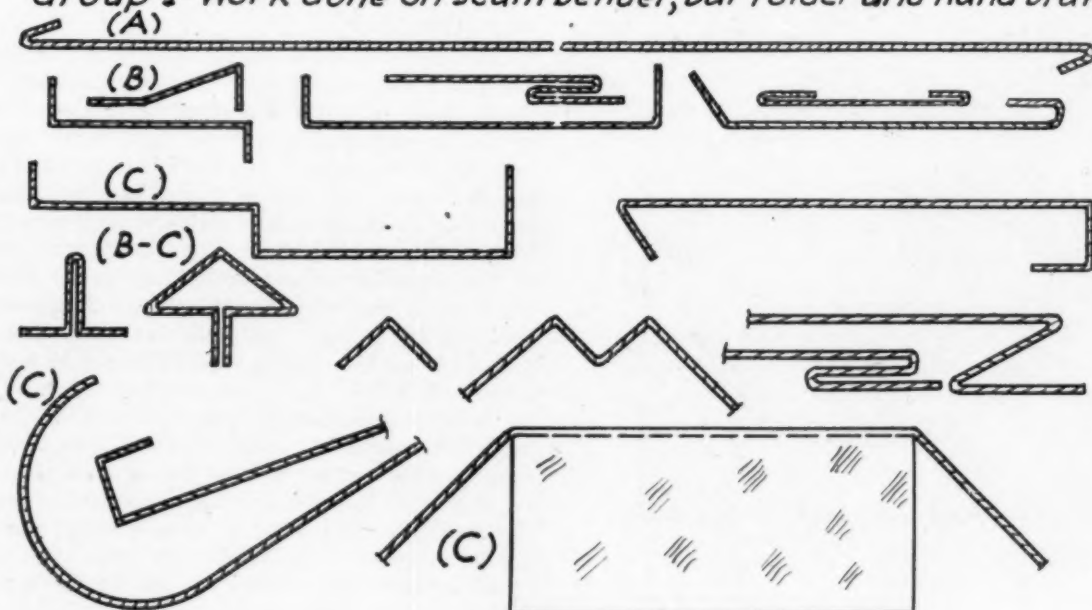
By Ernest E. Zideck
Sheet Metal Consulting Engineer

Sheet Metal Forming

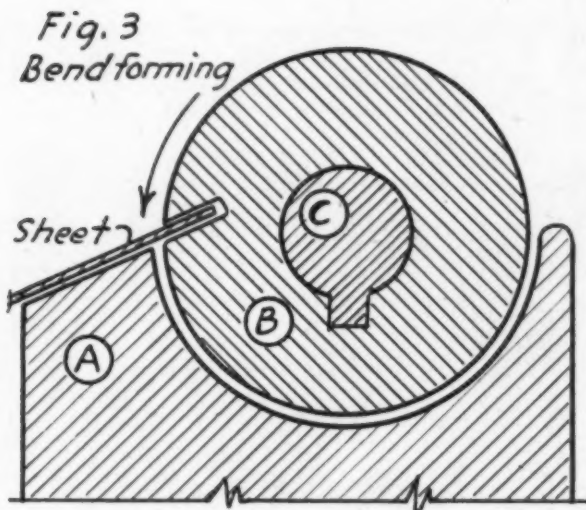
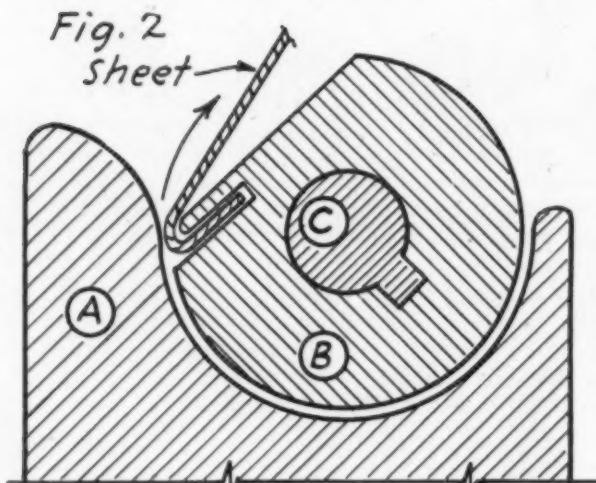
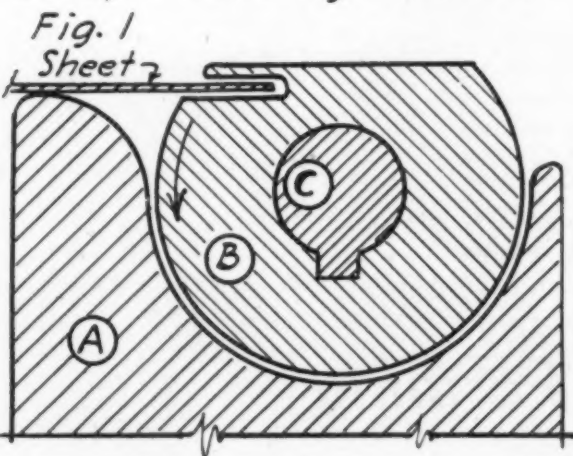
HAVING dealt with sheet metal *blanking* in the foregoing articles of this series, we now approach the subject of sheet metal *forming*, commencing with the most common shop equipment, which in ninety out of a hundred sheet metal shops consists of a seam bender with possibly a rod beader, a bar folder, a hand-operated brake, pipe rolls, and a number of the small rotary beading-crimping-edge-turning machines. In the present article we deal with the seam bender, the folder and the handbrake work only, leaving the other mentioned hand machines for the forthcoming

installment. We omit from consideration such formative tools as a roofing tongs, hammer or mallet in connection with a clamping device such as a vise, and other older-practice tools, because in the contemporary sheet metal shop such tools or practices are no longer prevalent. On the other hand the bending of sheet metal in preparation for seaming, the folding of the sheet edge for reinforcement or other purposes, and the braking of the sheet into a variety of formations, are not only common to every sheet metal shop but constitute in many cases two-thirds of the work done

Group 1- Work done on seam bender, bar folder and hand brake



Group 2 Bends by rotation



in it. That being the case, a study of the three machines in view of pre-determination of work that is best done in this or that of the three, is a vital factor in work systematization and shop efficiency.

Some Types of Forming

In Group 1, of the accompanying illustrations, is randomly sketched a number of formations in sheet metal, with letters (a), (b), (c), indicating in which of the three aforesaid machines the particular bend or form can best be accomplished. (A) shows a sheet provided with seam-bends prior to rolling same for a pipe or, seaming the flat piece onto another part or, providing the seam-bends prior to other formative work on the sheet. This comparatively simple hook-like formation ceases to be simple however, if we have to do the work in quantity, making fifty or more joints of pipe or, bending seams in tin or copper sheets for what used to be called deckroofing. If the sheets are of a thin gauge metal and the seam is of a length accommodated in the seam-bender or bar folder, we can make the hook in one operation, whereas if we use the handbrake, even if we can gage the metal by the narrow part of the movable leaf, we shall need two operations, with the attendant danger of squeezing the metal down too much for the purpose. The best machine for the above work, granting the thin gage of metal and the length of the seam aforesaid, is the small, but unequalled in this kind of performance, pipe seam bender. The bar folder is less adapted for this work because the whole width of the metal must be upraised and flaps over the machine (as illustrated further on, under Group 3).

Formatures indicated by the letter (B) in Group 1, can be done in the bar folder, provided the metal is thin enough and short enough for the machine. Formatures (B-C), granting above conditions as to gauge of the metal and the length of the piece worked, can be prepared in the bar folder and completed in the handbrake. The (C) formatures, finally, cannot be made in the bar folder and must be accomplished in the handbrake. We shall, as we proceed to illustrations under the Groups 2, 3, and 4, treat with the subject more profoundly.

The stove pipe seam bender, owing to its initial construction adapted for only metal thicknesses above the 26-gauge and pipe lengths of 24 inches or less, has been widely abandoned in sheet metal work. Its merit consisted of *one hand* operation, the right hand clamping the metal edge, gaging it, and bending it into the hook-like shape, all in one quick operation, while the left hand upheld the sheet. There being movable parts in the structure, gaging and clamping the metal for the bend, it was seen that this device would not work satisfactorily if the machine was made longer, to accommodate the standard galvanized pipe lengths of 28 and 30 inches. And inasmuch as the tin pipe used in furnace installations was obtained ready-made, nestled, this kind of pipemaking had come to a standstill, and the bender was no longer used. The small, inconspicuous machine had been designed for only the one special work, that of forming quickly, and on the whole accurately, the seam-hook. But the need for making these seam-hooks in the longer and often heavier gauges of metal, continued.

At one time the manufacturers tried to solve the problem by grooving one of the cylinders in the sheet metal rolls, somewhat similar to the groove in the cylinder Fig. 3, Group 2, of illustrations. The sheet was inserted into the groove and then brought in contact with the reciprocating roll, the partial rotation bending the metal and forming the hook, resembling the hook by which the metal holds tight in a rod beader, which the said Fig. 3 roughly portrays. The conventional rod beader has a housing (A) reaching over the rod or cylinder (B), with (C) denoting an insertable shaft with key, which can be either, part of the handle, or power transmission. In these sketches we illustrate only the principles of performance of the depicted tool or mechanism, without enlarging on particulars of constructions, which differ, there being varying makes of the devices in vogue.

Methods of Forming Seam Hook

Fig. 1, and 2, of the Group 2, of illustrations, disclose a housing, (A-A), a rotary shaft (B-B), and means of rotating the shaft, (C-C). The device is an imitation of the rod beader and an improvement over the aforesaid grooved roll in sheet metal rolls. This latter contrivance for forming the seam-hook has been abandoned because the hook was not adequate for seam grooving, and the radial shaping of the metal in this practice was not conducive to smooth working of the sheet. On the other hand the device Fig. 1, and as shown operating in Fig. 2, left the sheet comparatively unmarred by the smooth, radial shoulder of the housing (A) over which it slid on the shaft (B) rotating downward, as shown in Fig. 2. The housing (A) and the shaft (B) are of a length accommodating 36-inch lengths of sheet metal; and the diameter of the shaft is two inches, with the tongue over the sheet-receiving slot strong enough for working 24-ga. sheet metal. This is a hand-operated device requiring a large leverage handle, for moving the shaft (B) down as shown in Fig. 2, and backward for disengaging the hooked sheet. The common detriment to forming these seam-hooks is the flapping of the sheet upward (which we encounter also in the Press Brake).

Action of Bar Folder

Proceeding further, we see in the Group 3 of the illustrations, that the bar folder too, flaps the sheet upward and over the machine in this seam-hook forming, as depicted in Fig. 2.—This is so because the bar folder is provided with a gage moving on a distance of one inch only, so that we cannot insert the sheet farther than that. The gaging arrangement is invaluable, however, because we can adjust the gage to any width of a bend between $\frac{1}{8}$ and $\frac{15}{16}$ of an inch. The bar folder construction admits of seam-hook forming by one operation, as of Fig. 2; and of doubling the metal by another operation, as of Fig. 3. But owing to the width of the bar (leaf) in this construction, we cannot productively do such forming work in this machine as shown under (C) in Group 1, of the sketches, the interfering bar (leaf) permitting of only marginal bends as shown under (B) in the sketches. These bends are confined to widths not more than one inch from the edge of the sheet, and although we can bend the metal to any degree, we cannot very well

Group 3. Folding machine work
Fig. 1

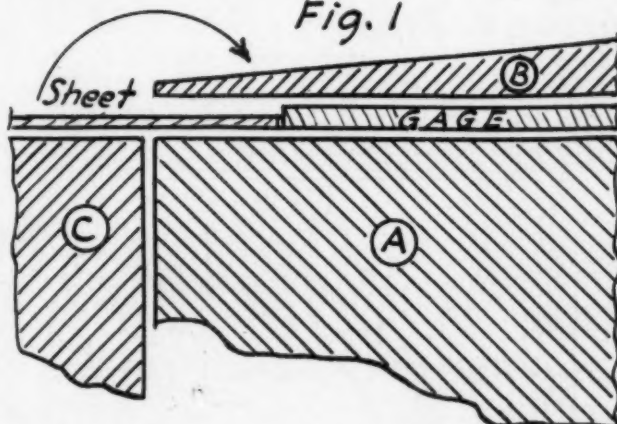


Fig. 2

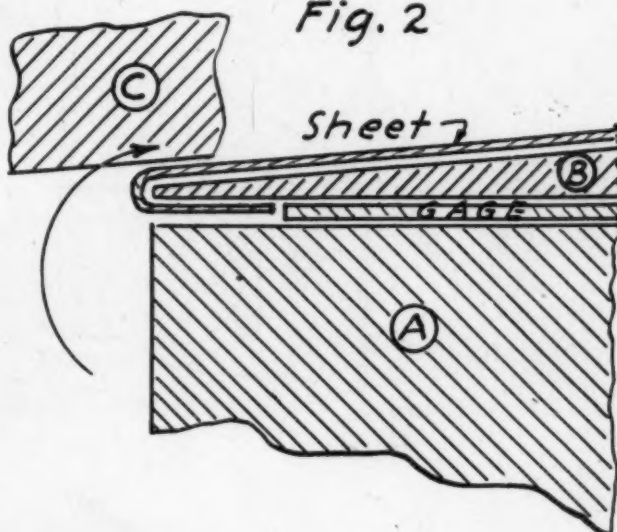
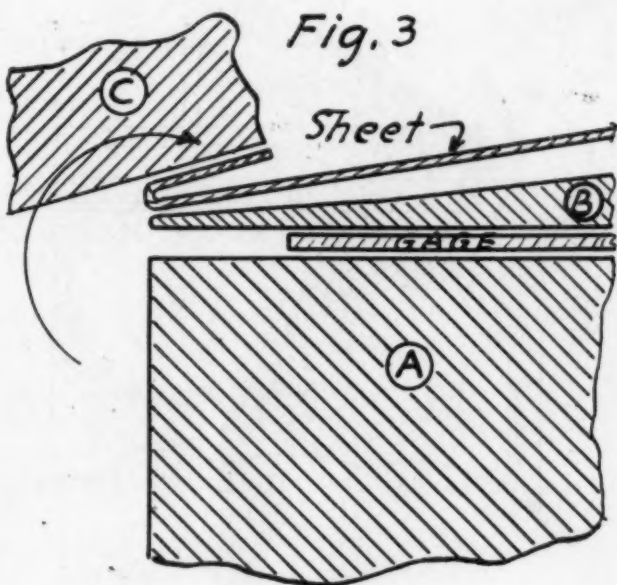


Fig. 3



Group 4. Braking operations

Fig. 1

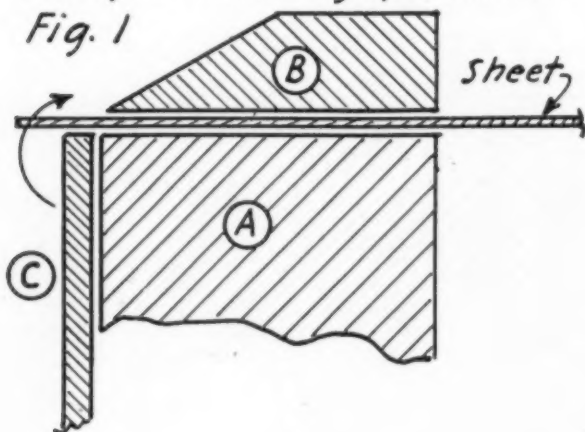


Fig. 2

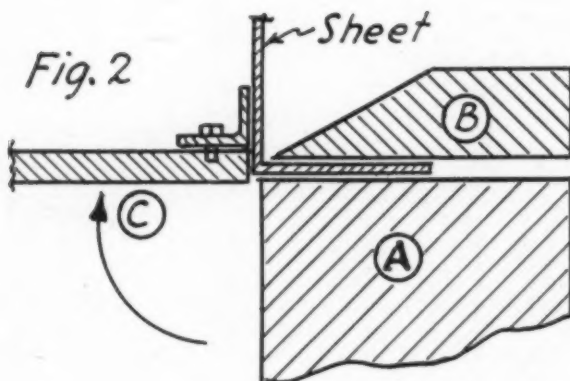
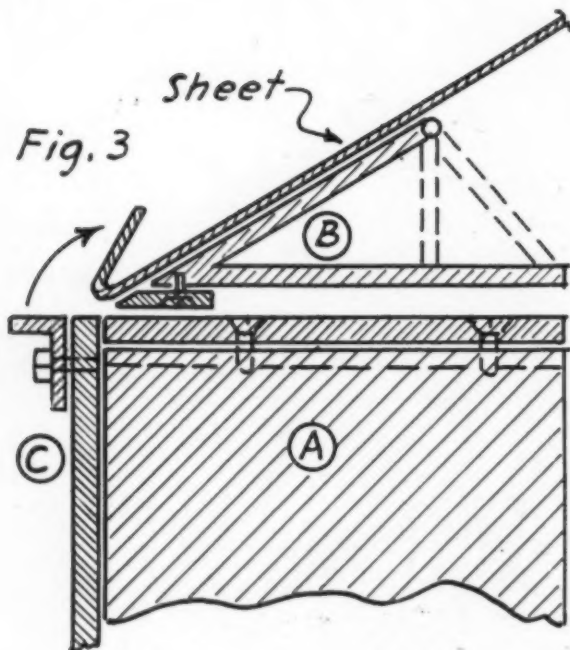


Fig. 3



(productively) make step-formations as shown under (C) in the sketches. It is to be regretted that the bar folder manufacturers have failed to improve the machine, providing a bar (leaf) in the shape of an angle, with only $\frac{1}{4}$ or $\frac{3}{8}$ of an inch leaf-width contacting the metal to be worked.

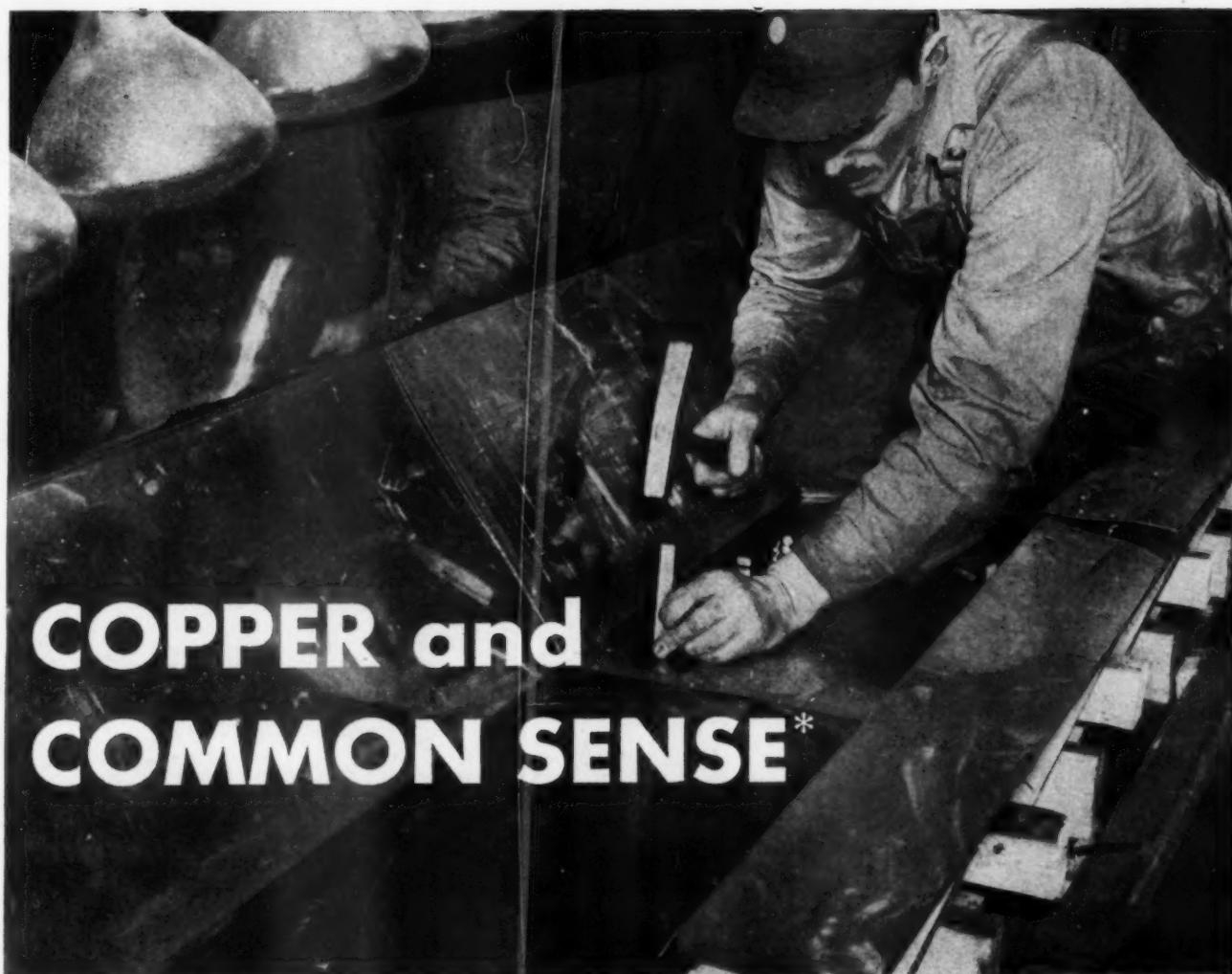
Again, in sketching the work of a bar folder in Group 3, we do not show more than the principles of performance owing to varying makes and details of construction of these machines. (A) in the three Figs. denotes a housing, commonly reposing on a bench and fastened to it. (B) indicates the top portion of the machine, commonly bolted to the housing. And (C) substitutes for a detailed picture of the movable bar (leaf), which moves upward and radially on pivots lodged in the housing. The gage, so marked in the sketches, is operated by handles on shafts threaded into the housing. Arrangements of the gage details differ, but the principle remains the same. The bar (C), in the idling machine on a level with the surface of (B), to move (bend) the sheet inserted over it (over the working surface of (C), over the edge of (B).

In a few makes of the machine the gage moves in slots in (B), so that (C) operates more like a leaf-brake, eliminating the rise of (C). The operators of a bar folder are well acquainted with the construction details of the machine in their hands, and it is not necessary for us to go into the details, except only as to the principles underlying the performance of a bar folder. Suffice it to say that, as concerns the nature of the performance, of bends and formative shapes productively practical of being worked in a bar folder, all makes perform alike and the work done in them is limited to bends, folds and doubling of metal in the edge portions of the sheet. We can, laboriously, accomplish a seam for Pittsburgh lock in the bar folder, as shown under (B) formatures in Group 1; but this kind of work is non-productive in an efficiency sense, and is done much better and quicker in other machines.

The Brake

In contemporary sheet metal shops eighty per cent of all formative work is done in the brake. And because not more than ten per cent of all sheet metal working shops (inclusive of factories) possess a press brake, the work is done in the older types of brakes, called leaf brakes. Whether this brake is hand operated or power operated, it performs upon the identical principle of (a), feeding the sheet into the machine horizontally; (b), the machine clamping the sheet tight for operation; and, (c), the suspended bar or leaf, also called apron, moving on pilots lodged in the housing and engaging the portion of the sheet which it contacts. In Group 4, of the illustrations, we again confine ourselves to the principles of performance, not showing the details of construction of the machine. (A) in the three Figs. is the base, or bed, extending on legs or sides to the floor. (B) is the clamping portion of the brake, variously constructed of solid material as also of plate, welded together. And (C) is the movable leaf or apron which engages the sheet held between (A) and (B), and brakes it over the beveled (sharp) edge of (B).

The advantage of the brake lies in the narrow width
(Please turn to page 160)



COPPER and COMMON SENSE*

*Revere's 96-Page Manual of Sheet Copper Construction

Photographed at Revere Research Laboratories

QUESTION: Where can you get data on any phase of sheet copper construction?

ANSWER: From the Revere Technical Advisory Service, Architectural.

IN order to help you provide the finest sheet copper construction, Revere Research takes nothing for granted. The *whole subject* is constantly under study in the Revere Research Laboratories; and important new facts are available which enable you to design or install copper gutter linings, flashings and roofs that give *extra* years of service.

An example of the thoroughness of this work is a recent investigation of the holding power of various types of nails. Revere is interested not only in seeing to it that the right specifications of copper are used, but also in every factor, large or small, that will help your jobs give lasting satisfaction.

Whenever you are faced with a problem concerning the design or installation of copper, look first to the Revere manual; and if you do not find the complete answer there, the Revere

Technical Advisory Service, Architectural, will be glad to help you. The chances are that they have already had experience with a similar problem. In any case, they'll do their best to help solve yours.

There is no charge or other obligation for this service. Simply call your Revere Distributor or the Revere office nearest to you.

REVERE

COPPER AND BRASS INCORPORATED

Founded by Paul Revere in 1801

230 Park Avenue, New York 17, New York

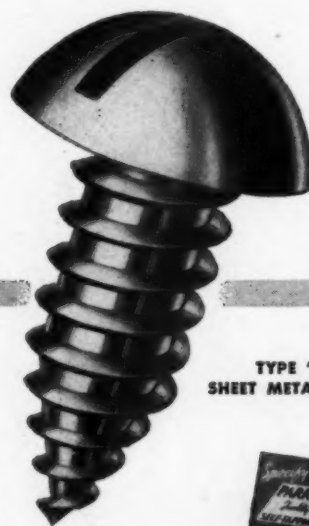
Mills: Baltimore, Md.; Chicago, Ill.; Detroit, Mich.;

New Bedford, Mass.; Rome, N. Y.

Sales Offices in Principal Cities, Distributors Everywhere



**"WE TRIED OTHERS BUT
ALWAYS CAME BACK TO P-K"**



**TYPE "A"
SHEET METAL SCREWS**

● There's a good reason so many sheet metal men feel this way about P-K Type "A" Sheet Metal Screws. For more than 30 years P-K's Type "A" has helped sheet metal contractors do better work and make bigger profits through faster, stronger assemblies. There's nothing like Type "A" for ducts, fan housings, exhaust systems—any sheet metal assembly up to 18 gauge.

And Type "A" is only one of a famous family of P-K fastening devices. It's plain common sense for you to take advantage of every "short-cut" they make possible by eliminating tapping, bolting, riveting, soldering.

Got a job using heavy sheets? Use Type "Z" or the heavy duty Hex Head Type "Z". Type "Z" is made in Stainless, too, if you make stainless equipment for restaurants, etc.

Got a job requiring fastenings to masonry? P-K Masonry nails are "made to order"—easier, quicker and cheaper than other methods.

Got a siding job? Use P-K Screwnails. They drive easily as nails — hold like screws.

Know the Complete Line of P-K Fastenings!

Write for Booklets Nos. 480 and 475A. Booklet No. 480 lists proper hole sizes for efficient driving and maximum security, and gives other helpful information. **SAMPLES, too.** Just tell us what you are fastening. Parker-Kalon Corporation, 200 Varick St., New York 14.



**TYPE
"A"**



**TYPE
"Z"**



**HEX HEAD
TYPE "Z"**

P-K



**TYPE
"U"**



**TYPE
"U"**



**MASONRY
NAIL**



**SCREW
NAIL**

PARKER-KALON

SELF-TAPPING SCREWS

A FASTENING FOR EVERY METAL AND PLASTIC ASSEMBLY



Photo—Courtesy Warren Petroleum Corp.

GROWTH OF LP-GAS INDUSTRY

By Howard D. White
Executive Vice President
Liquefied Petroleum Gas Association, Inc.

Warm air furnace manufacturers have already recognized L P Gas as a fuel by designing units for its use. This speech was delivered by Mr. White at the National Warm Air Heating & Air Conditioning Association Convention in Cleveland on December 5. The full text is printed here because it provides historical background for a series of articles that will describe all phases of L P Gas as applied to warm air heating systems.

AS THE name implies, Liquefied Petroleum Gas is a product of the petroleum industry, gaseous under normal conditions, liquid under pressure.

Its main source is the gas from the oil and natural gas wells. Secondary sources are found in refining process and the recycling of natural gas.

As early as 1810, a company in London produced and marketed a few containers of compressed gas. In 1870, a similar product called "pintsch gas" was placed in commercial use and reached considerable popularity in the lighting of railway cars. About 1907, Herman Blau, a German scientist, developed a process for the cracking of oil in a furnace, recovering the gas and liquefying it under a pressure of 1800 pounds psi. Several companies were organized to market it in this country under the name "Blau-Gas," but the fuel was not generally satisfactory and the cost of equipment and its transportation presented serious complications.

What was required was a gas which would operate at comparatively low pressures; a gas of standard and

uniform chemical composition, available in large quantities, at a reasonable price and one whose transportation posed no unusual obstacles.

These requirements were satisfied by the recovery of butane and propane gases as a by-product of refining and their liquefaction under pressure.

First Successful U.S. Production

In 1910, the Riverside Oil Company produced about 200 gallons under the supervision of A. N. Kerr, the general superintendent. Within a year, Mr. Kerr with several associates, formed the American Gas Oil Company to develop utilizing equipment on a commercial scale.

In 1920, Carbide & Carbon Chemical Corporation placed "Pyrofax" on the market. Between 1927 and 1930, six major oil companies entered the field and today, according to the latest reports, 480 plants in 22 states are in production with 40 more under construction or scheduled for construction within the next

18 months. That the pioneers in the industry were correct in their forecast of the demand for a fuel which would meet the requirements of low pressure, uniform composition, general availability, reasonable cost, and easy transportation, is demonstrated by the phenomenal growth the industry has already experienced.

In 1926, the first year of Bureau of Mines records of the production, 465,000 gallons were marketed. In 1946, sales reached 1,705,282,000 gallons.

The 1946 sales were 34% greater than 1945, and three times the sales of 1941.

The increase in use for peak-shaving and enrichment by city gas utility companies rose from 1,500,000 gallons in 1928 to an estimated 86,660,000 gallons in 1946—over 5600%.

Domestic Use of LP

Domestic or private home utilization reached 766,150,000 gallons in 1946, an increase of 43.7% over 1945. Industrial uses, that is for power, for metal treating, torch operation, enamel baking and the like showed the lowest increase. Consumption reached 159,115,000 gallons in 1946, a slight decrease from 1945. But this is probably due not to the lack of demand for the fuel so much as the shortage of materials required by industry to convert to its use. Sales for chemical purposes, such as the production of butadiene, styrene, butyl rubber, thiokol, carbon blacks, nitro-paraffins, ethylene, cyclopropane, propylenes, butylenes, alcohols and acetones, antifreeze compounds, solvents, thinners, plastics and other synthetics, and a multitude of others in 1946 reached 597,000,000 gallons, an increase of some 83½%.

Agricultural uses are wide and on the increase for hay, cotton, fruit, tobacco drying, and the like; for water pumping, chicken brooding, milk can sterilization; and a very promising development is seen in flame cultivation and weed burning. Future expansion for many years to come is apparently limited only by the limits of fuel supply, transportation and utilizing equipment.

Fuel Characteristics

Now, let's see what this fuel is. The term Liquefied Petroleum Gas—or LP-Gas, as we call it, is a generic term for propane and butane and propane-butane mixtures. The qualitative standards, as set up by the Natural Gas Association of America, for Liquefied Petroleum Gas are as follows:

1. **Commercial Propane** is a product containing 95% minimum of propane and/or propylene and dehydrated to pass the standard test for dryness. The vapor pressure at 105 F should not exceed 225 pounds per square inch, gage. The chemical formula of propane is C_3H_8 and for propylene C_3H_6 and they are usually referred to as C_3 hydrocarbons.
2. **Commercial Butane** is a product composed predominantly of butanes (isobutane or normal butane) and/or butylenes and with a vapor pressure not in excess of 75 psig at 105 F. The chemical formula for iso- and normal butane is C_4H_{10} and for butylenes C_4H_8 . They are usually referred to as C_4 hydrocarbons.

3. **Propane-Butane Mixtures** are mixtures of the above. The usual mixtures are those having a vapor pressure at 100 F of 80 psig (summer grade) and 100 psig (winter grade). The standards mentioned also set up maximum permissible contents of sulfur and also specifications for odorization.

The fuel then, in its gaseous state, resembles natural or manufactured gas except for these two principal differences: in Btu content, LP-Gas ranges from 2,520 to 3,270 per cubic foot as against the average rating of 530 to 1050 Btu per cubic foot for city gas. The other principal difference is in specific gravity. LP-Gas ranges from 1.5 to 2, while natural and manufactured gas has a specific gravity of less than 1.

In its liquid state, LP-Gas resembles gasoline in the way it is transported, measured and stored with the essential difference that it must be handled under pressure, for it is liquefied under pressure and instantly vaporizes at normal temperatures when the pressure is relieved.

Mixing Butane & Propane

Butane liquefies under lower pressure than propane and has a boiling point of approximately 32 F. Propane will vaporize at temperatures a little below 40 below zero F, with the result that it requires a higher pressure to liquefy propane. Propane is, therefore, preferred in colder climates and butane finds its greatest popularity in the temperate zones. However, for fuel uses the two are generally blended with consideration for the area in which it is to be used and 1946 sales show that 42% of the entire sales of LP-Gas was sold as butane-propane mixtures. That is pretty close to the quantity sold for domestic consumption.

Butane and propane then are pressure products and must be handled in pressure vessels. At 70 F commercial butane has a vapor pressure of approximately 30 lbs. psi while commercial propane has a vapor pressure of approximately 120 lbs. gauge. At 100 F commercial butane has a vapor pressure of approximately 60 lbs. gauge while commercial propane has a vapor pressure of approximately 190 lbs. gauge.

This pressure is proportionately varied, commercially, in ratio to the amounts of butane and propane blended in the product. And, its pressure is one of its principal assets.

Simplicity of Equipment

Apart from particular uses where vaporizers are practical for greater efficiency, LP-Gas flows from the container through pressure reducing regulators, under its own power. Thus, for the average use, pumps, pressurizing equipment and vaporizers are entirely eliminated.

If the correct fuel is used and the installation standard, LP-Gas will function economically, safely and efficiently, from its own self-contained system in any climate down to temperatures as low as 40 below zero and at lower temperatures with the addition of simple vaporizing equipment.

For city distributing plants and in some industrial operations where a high flow rate is required or where the fuel is to be mixed with air or injected for enrichment purposes, additional equipment is required. In propane air plants about 50% of the power costs can

be saved—slightly less with butane as the percentage of air is greater. But, we have today between 4 and 5 million homes where the cooking, refrigeration, water heating and space heating is all done on a simple system consisting of a fuel container, its safety devices, a pressure regulator and pipe line to the appliance.

This is modern "Living Beyond the Gas Mains."

Is LP Dangerous?

Now you will want to know something about what hazards are involved in the use of LP-Gas.

A short while ago, an insurance agent called me up for some general information about LP-Gas. He wanted to know—is it poisonous? Will it catch fire? Will it blow up?

It would not take long to guess that we would find it pretty difficult to sell it for fuel if it wouldn't burn. Also, anything which will burn will explode under proper conditions and some materials will explode under certain conditions which are difficult to burn under others, such as dust and wheat flour for instance.

All LP-Gas sold for fuel is odorized to smell like gas for the detection of leaks, but it is not toxic like manufactured gas. Suffocation would take place in adequate concentration similar to the effect of CO₂ gas, but the inhalation of LP-Gas produces no ill effects. It could only be fatal by the elimination of oxygen.

It will burn, but it has an exceptional feature in the fact that LP-Gas has a very narrow range of flammability; much narrower than natural or manufactured gas or gasoline. The limits of flammability of propane are 2.4 to 9.5%; of butane from 1.9 to 8.5%. Taking into consideration the narrow range of flammability together with the rapid rate of diffusion, LP-Gas leaks are therefore not as hazardous as natural gas leaks.

However, since the product is under pressure, a leak can spill out large quantities of gas in a short space of time. Another feature which must be borne in mind is that LP-Gas is heavier than air. It will settle in low places, run down hill or enter windows lower than its source.

It has, however, a higher dispersal rate than is generally recognized. It will dissipate from low areas and pockets even without the flow of air. In the open air its dispersal rate is rapid.

In consideration of these facts, our industry has developed from its beginning, a close and intimate affiliation with the Interstate Commerce Commission, the Bureau of Explosives, the National Board of Fire Underwriters, Underwriters Laboratories, National Conservation Bureau and many other protective organization and institutions.

Container Construction

Our containers are built to the codes of the Interstate Commerce Commission, the American Petroleum Institute or the American Society of Mechanical Engineers, for unfired pressure vessels. Our safety devices, regulators, relief valves, excess flow valves and shut-offs are submitted to, and approved by, the Underwriters Laboratories. Our appliances are laboratory approved. Our standard installations are made according to the regulations of the National Board of Fire Underwriters, Pamphlet 58, the LP-Gas Code.

We have developed, as an industry, ample engineering ability and adequate experience to comply with all safety requirements. Accidents won't happen, nor hazards be created, if the regulations are followed and approved equipment employed and maintained by competent operators.

There is some loss of life, annually, from overfilling truck tires with air; there is much from water; there is more from ignorance and carelessness. I doubt if we can ever fully stop the man who looks for a gas leak with a match.

But the proper use of LP-Gas is thoroughly safe, like the proper use of any other energy.

This is attested by the fact that our industry has grown from nothing, 25 years ago, to its present status, with some 480 producing plants; more than 2500 bulk distributing plants; some 25,000 dealers and 15,000 appliance outlets, with between 4 to 5 million domestic consumers and 348 town distributing plants.

Supply of LP-Gas

We added about 1,000,000 new customers last year and could do much better this year, and for many years to come, if supplies can be maintained.

What shall we say, then, on the subject of supply?

As for equipment and appliances, we count on a feeble trickle until steel production is adequate. When that times comes, will there be sufficient fuel?

Except for the past winter, the production of LP-Gas has exceeded demand with a definite oversupply in the warm weather. This is one of the industry's major problems—the problem of the unbalanced demand.

You will remember, in its origin, LP-Gas was purely a by-product. Producers had the choice of selling it for anything they could get or flaring it in the field.

But as demand grew, production capacities had to be expanded through capital investment. I learn from an address of Mr. George Benz of Phillips Petroleum Company that the investment required to increase production and distribution by 8 carloads of propane per day approximates \$2,000,000. The vast expansion made by producers in recent years and that which is now under way has, obviously, long since taken the production out of the by-product class, and sales now must be related to capital investment.

Since the product is in greatest demand during the heating season, top demand production leaves a summer surplus which cannot be economically stored because of the unreasonable investment in large capacity pressure storage which would lie idle throughout the winter.

Likewise, although there are in excess of 4,000 pressure tank cars, averaging 10,000 gallon capacity, in LP-Gas use, the industry is short by some 1200 cars, at the present time, of meeting the demand of winter season transportation. So if the producers would economically store it, there would still be too few cars to deliver it at the peak of the season.

This condition embarrassed us last winter and will again until tank car production can catch up.

A solution is in prospect and has been somewhat approximated by the industry backing a program to provide larger consumer storage which could be filled from the summer surplus. A great deal has been

(Please turn to page 164)

ASSOCIATION ACTIVITIES



New York State

THE New York State Sheet Metal, Roofing & Air Conditioning Contractors' Association, Inc., has set the date for their annual convention as April 5, 6 and 7, 1948, at Rochester, N. Y.

This is the 25th anniversary of the founding of the New York State association and special emphasis will be placed on this feature for special attendance.—*Clarence J. Meyer, State Secretary.*

Indiana

AT THE October 4 meeting of the Sheet Metal and Warm Air Heating Contractors' Association of Indiana, President H. W. Meggs appointed the following convention committee for the 30th annual to be held at the Hotel Severin, Indianapolis, February 5 and 6, 1948:

Wm. E. Garber, Jr., Chairman, Homer Selch and E. L. (Budd) Carr.

Chairman Garber appointed the following committees:

Reception Committee—E. E. Meeks, Chairman; Wm. Shea, R. C. Hurt, Howard Tout, M. K. Primick, Ted Kolbus, Paul Jordan, Marvin Brezette, W. LeRoy Hunter, W. H. Tudor, C. McManama, Russell Thompson, Joe Mattingly, Lee Gilesie, W. F. Phillips, H. Singleton, Geo. Primick, Pete Buell, S. H. Turnbull, H. E. Rhein, Herman Schmidt.

Banquet and Luncheon Committee—Ralph Mullin, Chairman, and Homer Selch.

Entertainment Committee—M. L. Thompson, Chief Representative; A. A. Nemece, Ted Kolbus.

Door Prize Committee—Bill Mendor, Chairman; Stubby Mathews, Herman Schmidt, Bob Renick, Frank Muts, Ted Kolbus.

Ladies Committee—Howard Tout, Chairman; Wm. Shea, Joe Mattingly.

Question Box Committee—Don McCloskey, Chairman; Phil Cordes, B. J. Currie.

Hotel Committee—Homer Selch, Chairman, A. A. Nemece.

Sheet Metal Distributors

THE thirty-seventh semi-annual meeting of The National Association of Sheet Metal Distributors held in Atlantic City was unusually well attended and the program outstanding.

The following officers were elected to serve for the ensuing year:

President—John P. Speck, Tiffin Art Metal Co., Tiffin, Ohio
Vice-Presidents—Ray Farrington, Potts-Farrington Co., Philadelphia; Paul M. McKenney, Conklin Tin Plate & Metal Co., Atlanta, Ga.

Members of the Executive Committee are:

Terms Expiring 1948

William A. Vernier, Superior Safety Furnace Pipe Co., Detroit
Alexander Thomson, Tanner and Company, Indianapolis.

Terms Expiring 1949

William H. Bowe, Herrick Company, Boston
Lee J. Haines, E. E. Souther Iron Co., St. Louis

Terms Expiring 1950

Joseph F. Stumpf, York Corrugating Co., Jersey City
Roger K. Becker, Ohio Valley Hardware & Roofing Co., Evansville, Ind.

Thomas A. Fernley, Jr., Secy-Treas., Philadelphia.

Ohio

AT THE last directors' meeting of the Ohio Sheet Metal Contractors Association the date and location for the next convention was set. It will be held March 22, 23, and 24 at the Netherland Plaza in Cincinnati.

The convention chairman is State President Philip C. Young, and the convention treasurer is J. Jacobson of Cincinnati.

Preliminary plans have been arranged, and the Cincinnati folks will be out to give an outstanding convention.—*W. E. Bogen, Secy.*

Indoor Comfort Conferences

THE first four heating engineering schools scheduled by the National Warm Air Heating and Air Conditioning Association for the coming year with the name of the local chairman of each follows:

City	Dates	Local Chairman
Louisville, Ky.	Jan. 7, 8, & 9	H. B. Villevik Hart Furnace & Supply Co. 238 East Main Street Louisville, Ky.
Nashville, Tenn.	Jan. 14, 15, & 16	Frank Cline Cline Air Equipment Co. 311 Eighth Avenue, So. Nashville, Tenn.
Knoxville, Tenn.	Pending. Will probably be week of January 19th	W. S. Willis C. M. McClung & Company Knoxville 7, Tenn.
Birmingham, Ala.	Jan. 28, 29, & 30	George F. Wheelock The Geo. F. Wheelock Co. 3013 S. Second Ave. Birmingham, Ala.

Detailed information and registration blanks for each of the above conferences may be obtained directly from the respective local chairmen.

The tuition fees for the three-day schools will remain the same as they have been for the two-day schools since June of this year, in spite of increased costs in the operation of the school program.—*George Boeddener, Managing Director, National Warm Air Heating & Air Conditioning Association, 145 Public Square Bldg., Cleveland 14.*

Obituary

Joseph C. Gardner, 81 years old, who served as the first president of the Sheet Metal Contractors Association of Indiana—1920-1922—and was elected an honorary member in 1945, died October 25 in his home at 615 North Delaware Street, Indianapolis.

After serving many years on the board of directors of the National Sheet Metal Contractors Association, he was elected president in 1928.

Surviving are two sons, Ramond and Edward A. Gardner; a daughter, and three grandchildren.

Sheet Metal Contractors' National

AT THE Board-of-Directors' meeting of the Sheet Metal Contractors' National Association—October 24 and 25—a slogan was adopted. It is: "A National Organization to Improve, Extend and Protect the Uses of Sheet Metal." This slogan appears on their new letterhead.

At this board meeting, the first since the annual convention last spring, the board approved and inaugurated a program of activity—shown in the reports of committees.

Bookkeeping and Estimating

The Bookkeeping Committee will start shortly on the second phase of its program—the exploration of a procedure for "estimating" sheet metal and heating work. The national secretary's office is now making a survey of costs of doing business, and the committee hopes to obtain data to enable them to overhaul their cost and estimating procedures. The committee believes that most contractors know how to establish their material and labor costs, but estimating sufficient costs for overhead, sales expense, profit, contingencies, etc., is not clearly understood.

Their first phase—the official National association bookkeeping system—incorporates all the best thinking on how to control costs to insure profitable operations. The system also turns up at proper dates all the reports required at the end of each quarter or the whole year. The system, complete with enough sheets to operate an average small shop for one full year, sells for \$30.

Warm Air Heating

The Warm Air Heating Committee under Chairman W. J. Keist is now mailing a special study report "Panel Heating—With Warm Air" showing the results obtained in a variety of floor and ceiling panel installations; design data for some of the tested jobs; and supplementary data which the contractor can use to determine if his panel system will produce the results desired. The warm air is passed through the floor to provide floor panel heating and is then released in part or full volume into the house to provide partial or full convection heating.

This panel-convection system provides all the advantages of panel heating plus the advantages of forced warm air heating—ventilation, humidification, air cleaning. The combined system also overcomes the panel system's inherent lack of quick response and makes provision for mild weather heating with close temperature control under all outside weather conditions.

The warm air heating committee also proposes to investigate the possibility of preparing a heating code for cities where no code is now in existence or where the code is obsolete.

Trade Relations

The Trade Relations Committee—E. B. Brown, Jr., Chairman—proposes continued urging of all association members and all contractors, to bid on every type of work our trade has been awarded jurisdictionally. A booklet entitled "Jurisdictional Decisions" lists all the important kinds of work which have been awarded either as spot decisions or as national awards, and each member will receive a copy within a short time.

Our trade has been awarded, but frequently does not include the following activities: acoustical metal ceilings; application of aluminum sheets lighter than 10-gauge; the application of covering materials for Quonset huts and the framework where lighter than 10-gauge material; all types of copper distilling apparatus; corrugated iron roofing and siding; steel roof decking; Careyduct; all types of kitchen and industrial equipment using all types of materials. For those who do not know just how to make an appeal for a jurisdictional award, the committee proposes a "basic brief" which can be filled in and filed with the awarding board.

A summary of the Chicago "Engineers Agreement"—an agreement between consulting engineers and sheet metal contractors—was submitted. The committee proposes to distribute copies of this "Engineers Agreement" to all members.

Labor Relations

Chairman Roy Dose of the Labor Relations Committee reported that his committee will explore the possibilities of a Standard Form of Uniform Agreement—the number of apprentices permitted, the overtime rate of pay, etc.

Membership

Chairman H. L. Orton reported that the National Association will make an effort to send officers to local meetings everywhere to explain the National program, now that the national offices are located.

State associations have agreed to give the National time on their annual convention program to report the activities of the committees. Chairman Orton reported special efforts will be made to have three or four National association officers at each state convention with reports of important activities.

Apprentice Training

The new Apprentice Training Program has two very important clauses:

- (1) It recommends that apprentices be indentured to the Joint Apprenticeship Committee and not to the individual employer
- (2) It gives the Joint Apprenticeship Committee the authority to place an apprentice in any shop—even a one-man shop—if the shop qualifies to train an apprentice

Association Activities . . .

The ratio of apprentices to journeymen is set at one apprentice to four journeymen. But the ratio is according to the number of journeymen in a local union's area—not the number of journeymen in any one shop.

Chairman Kramer and his committee will now devote their efforts to help contractor groups establish a Joint Apprenticeship Committee—now necessary in every area where there is a local union.

The apprentice training program has been declared by the Federal Apprentice Training Service to be one of the finest examples of industry cooperation in existence and the program has been adopted by Federal Apprentice Training Service.—*J. D. Wilder, Executive Secretary.*

Dayton, Ohio

THE fiftieth anniversary meeting of the Sheet Metal, Furnace & Roofing Contractors Association, Inc., (Dayton, Ohio) was celebrated with a dinner in the Silver Forest Room of the Miami Hotel on November 6, with an attendance of 41.

President Budde called the meeting to order with a roll call. Each contractor stood, introduced himself and gave a brief history of his past experience in the sheet metal business. These ranged from two to fifty years in business. Some of the old-timers had interesting stories to tell about the way tin shops were operated fifty years ago when they formed and made all the gutter, down spouts and elbows in their own shops. \$1.50 a day was a high wage for the best mechanics and they really had mechanics those days.

R. B. Kurfiss, chief of the Fire Prevention Bureau of Dayton, was the speaker of the evening. He talked on precautions to prevent fires which destroy property and lives, and showed photographs of fire hazards, the way fires get started and beyond control, victims suffering from burns, and the dead. He also showed a picture of poorly ventilated restaurant kitchens—one of the measures his department has to watch closely.

The National association's drive for membership at the November 15 meeting at the Biltmore Hotel with a free luncheon and with speakers on labor relations, vocational schools, warm air heating, etc., was announced.

The Dayton association is advertising every other week in the Tuesday *Herald* and Wednesday morning *Journal*. In addition to this advertising, the association and its members receive free-of-charge, once a month, a publicity story covering the activities of the association and its aims and endeavors toward better service. Each concern that ties in with the advertising will be publicized in these stories as members of the association. The cost for carrying copy within the association advertisement will be \$2 each insertion, to appear in both papers, and normally will amount to \$4 a month. The association space, paid for by the association, is two columns wide by one inch, and the contractor space is one column wide by one inch.—*A. J. Hoke, Secretary-Treasurer.*

St. Joseph Valley

THE Saint Joseph Valley Furnace and Sheet Metal Contractors, Inc., held their monthly meeting at their headquarters, 1406 South Michigan Street, South Bend, Indiana, with forty in attendance.

The president, J. R. Walker, conducted the regular meeting and when all the business was completed, the members of the Heating Code Committee, consisting of Messrs. DeWeert, Clafin, and Walker, reported on their meeting with the City Council regarding a heating code and a heating inspector.

After this business was transacted, Mr. Walker turned the meeting over to Robert D. Houk of the Tiffin Art Metal Co., who sponsored this evening's session with the aid of E. P. Sherer, sales representative and Mr. Peck, technical engineer, both of the Reynolds Metals Co. of Louisville, Kentucky. They conducted movies portraying the manufacture of aluminum, after which an open discussion was held regarding aluminum in the heating and building industry.

President Walker then closed the meeting and refreshments were served.—*William R. Tesky, Publicity Director.*

New York City

THE September issue of the "Institute Ticker" published by the Roofing and Sheet Metal Crafts Institute, New York City, reminds members of their Master Plan, the most important detail of which is their Code of Ethics which provides an effort to reeducate roofers and encourage ethical business conduct, and to make it known to present and prospective clients that members of the Roofers and Sheet Metal Crafts Institute live up to their slogan—Craftsmanship, Fairness, Reliability.

Reference is made to the National Employ the Physically Handicapped Week and the slogan "Hire the Handicapped—It's Good Business."

The September issue also contains the second and final installment of the recent report on the present status on building laws by C. H. Yull of the Construction Division of the Office of Domestic Commerce.

Fox Valley, Illinois

THE apprentice training committee of the Fox Valley Furnace and Sheet Metal Contractors' Association met Tuesday night, October 21st, at 9:00 p.m. in the high school at St. Charles.

For school use, they need tools. These need not be in perfect shape. Members are invited to bring to the next meeting anything they can in the line of shop tools, or information as to where the school can get some equipment such as rolls, burring and turning machines.

GI classes are held on Monday night at 7:30 and civilian classes on Tuesdays at 7:00 p.m.

Instructor Schiltz is well liked by the students and is doing an outstanding job.

The apprentice training committee has \$200 on deposit in the Merchants' National Bank.

The fall session of the school opened the week of the 20th, on Monday and Tuesday, as usual.—*Bill Stevens, Chairman, 79 S. LaSalle St., Aurora, Illinois.*

Association Activities . . .

United Roofing Contractors' Annual

THE 61st annual convention of The United Roofing Contractors' Association will be held at the Hotel Statler, Detroit, January 19, 20 and 21, 1948.

Contractors' and manufacturers' forums, popular last year, will be repeated. Both will be conducted by Carroll C. Figge, Chicago manufacturer of roof flashings.

Since the last convention, the URCA pursued the nail shortage investigation until it reached the ears of the U. S. Senate Interstate Commerce Committee. At the coming convention, Frank T. Nichols, president of the Nichols Steel & Wire Company, will present some behind-the-scenes information on the still grave problem of steel and steel product shortage. Mr. Nichols was a witness before the U. S. Senate Interstate Commerce Committee.

"Public Relations" for the roofing industry is the subject of a talk to be delivered by L. Rohe Walter, Director of Public Relations for the Flintkote Company. Mr. Walter is also an authority on the allied subject of direct mail advertising.

Walter Simon, president of the St. Clair Roofing Company, St. Louis, will cover improved business relations between manufacturers and contractors. Mr. Simon's wit has enlivened many URCA conventions.

John P. Reuter, St. Louis, will mount the convention rostrum in the capacity of Chairman of the Labor Relations Committee of the National association, reporting on the work of this committee and its efforts to improve relations with the industry's mechanics and applicators.

Presidents of all local and state associations affiliated with the national will report.

Manufacturers will be armed with facts and figures showing the tremendous strides in production and describe what the industry has done in enlarging old plants and building new plants to give further service.

H. R. Smoke, Director of Exterior Coverings of the U. S. Bureau of Standards, will talk on the work of the Bureau of Standards in relation to the roofing industry.

Carolinas

THE Carolinas Roofing & Sheet Metal Contractors Association reminds members about the Indoor Comfort Conferences sponsored by the Natl. Warm Air Heating and Air Conditioning Association and invites those interested to write J. H. Martin of Home-Wilson, Inc., Charlotte, N. C., or W. H. Arthur, Jr., secretary, stating whether or not they are interested and how many from each firm would attend the conference. The tentative schedule now laid out would make it possible to conduct a school in Charlotte about the middle of February, 1948. The association would like to know if there are enough interested people desirous of the school in Charlotte at this time. The suitability of the date would depend, to a considerable extent, on the ability to obtain adequate meeting room accommodations set up to seat 200 students at tables, facing the instructor.

Canada

THE October monthly news letter of the Canadian Chapter of The National Warm Air Heating and Air Conditioning Association calls attention to "Continuous Blower Operation" and its advantages. Air moving slowly and at a low temperature provides desirable ventilation. To run a blower slowly takes less electrical current than at high speed.

Following are the basic steps for continuous blower operation:

1. Determine the approximate input required and adjust the input to this value. By keeping the input as low as possible, the firing mechanism will operate more hours per day and cycle more frequently. This results in a delivery of heat to the furnace at a more uniform rate, that will more nearly balance the heat loss of the house.
2. Set bonnet limit switch at 200F.
3. Reduce blower switch differential to minimum.
4. Check manual No. 7, page 31 for blower cut-in and shut-off temperature settings.
5. Advance thermostat to run automatic firing continuously during test.
6. Check outlet air temperature in main duct near furnace.
7. Make necessary blower speed adjustment until air temperature reaches maximum of approximately 170 deg.
8. Re-set thermostat and make any final adjustments if necessary.

Panel Heating

One hears and reads considerable comment relative to heating homes by circulating hot water through wrought iron or copper pipes embedded in floors, walls, or ceilings. The public has been given to believe that this is the method of heating. Warm air may also be circulated to provide the best of panel heating. The real answer might well be a combination of warm air panel heating plus a percentage of forced air for ventilation. The Association intends to publish a manual for the design of forced air ceiling panels. When available all members will be informed.

Coming Conventions

1948

- Jan. 19-21—The United Roofing Contractors' Association. 61st Annual, Hotel Statler, Detroit. James McCawley, Exec. Sec'y.
- Jan. 26-29—Air Conditioning Exposition. Refrigeration Equipment Manufacturers Association, Cleveland Auditorium, Cleveland.
- Feb. 2-6—Eighth International Heating and Ventilating Exposition. Grand Central Palace, New York City.
- Feb. 5-6—Sheet Metal and Warm Air Heating Contractors' Association of Indiana, Inc. 30th Annual. Hotel Severin, Indianapolis. Frank E. Anderson, Sec'y., 439 S. 17th St., Terre Haute.
- Feb. 8-11—Sheet Metal Contractors' Association of Wisconsin, Inc. 33rd Annual. Schroeder Hotel, Milwaukee. Paul L. Biersach, Sec'y., 225 E. Michigan St., Milwaukee 2.

EQUIPMENT DEVELOPMENTS

Use the Coupon on Page 134

183—Vent Cap

The Karol air even pull—a patented vent cap—sets nearly flush with the roof, and still maintains an even pull regardless of unusual draft conditions.

The Karol Air is in production, and will be made in larger sizes for

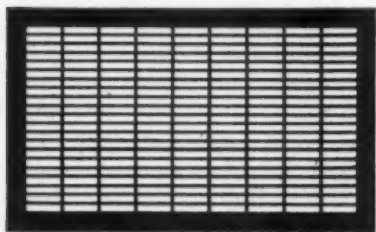


use as ventilators. It has been tested by the Board of Building and Safety, City of Los Angeles, and approved for adoption in the building code.—*Hammel Radiator Engineering Company, 3348 Motor Ave., Los Angeles 34.*

184—Attic Grilles

A complete line of inexpensive grilles for use in attic ventilation applications provide a 75 percent free area for air passage.

The grilles are available in virtually any dimensions on regular



half-inch centers vertically and two-inch centers horizontally.

Grilles are produced in 12-gauge or lighter steel, with slots 11/32 x 27/32 in. and cross bars 5/32 in. Finish and overall dimensions follow purchaser's specifications. The grilles are primarily for ceiling and sidewall installations.—*A-J Manufacturing Company, 2119 Washington Street, Kansas City 8, Missouri.*

185—Tail Gate Loader

A handy, low-priced hydraulic tail gate loader for trucks is offered.

The lift platform operates over the full distance from ground to



truck floor level, raising and lowering loads up to 1200 pounds. The platform swings up to serve as a tail gate.

The hydraulic pump is driven from the truck's standard power takeoff and is controlled by a convenient lever, or the pump can be operated with a hand lever.—*The Day Company, 306 West 69th St., Chicago 21.*

186—Safety Clutch

The new power failure clutch, built into the A-P damper regulator unit of the control set is bi-metal actuated through the power source. If the power falls while the furnace draft is turned on, the safety clutch is disengaged and prompt action



moves the damper regulator to the "off" position.

When power is again resumed, the operation of the damper regulator continues automatically.

The A-P damper regulator unit also embodies a "stoking safety" advantage.

The damper regulator unit with its new power failure safety clutch and "stoking safety" features is part of a complete set including the standard A-P "heat anticipating" room thermostat, Limit Control, transformer, chains and all wiring for installation.—*Automatic Products Company, 2450 North Thirty-Second Street, Milwaukee 10.*

187—Health-aire Blowers

"Health-aire" Blowers are available in a wide range of sizes—from 4 to 47 in.—in single or double width



types and equipped with low speed forward curve blades.

"Health-aire" blowers are of all-steel construction.—*Johnson Fan & Blower Corporation, 1319 W. Lake St., Chicago 7.*

188—Sequence Control

A new control converts spot welders for the production of aluminum spot welds—a new low-cost sequence control capable of converting ordinary resistance welders to the production of high-strength spot welds in sheet aluminum and most non-ferrous metals.

The Acro aluminum sequence control can be used with any type air-operated spot welder of suffi-



cient capacity. It is a refinement of the forge-delay principle. Easily installed and operated, it works in conjunction with standard transformer-type A-C air-operated, welding machines, timers and contactors.

Two sizes—Models AP-45 and AP-65—fit the need for the entire range of air-operated spot welders.—*Acro Welder Mfg. Co., 1825 W. St. Paul Av., Milwaukee 3.*

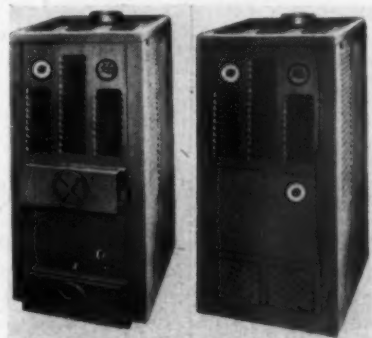
EQUIPMENT DEVELOPMENTS

Use the Coupon on Page 134

189—Free-Aire Heaters

Free-Aire coal and oil heaters are used as furnaces for both conventional duct systems and with their Free-Aire minimum duct systems for low cost homes.

Coal Unit—1/40th hp motor insulated against heat. Rocking and dumping type grates. Removable ash pan. Ground cast doors and draft controls. 18 in. brick refractory fire pot. Removable and adjustable discharge grille. Removable panel for cold air return. 18 in. propeller type fan—rheostatic fan



operation—any speed up to 600 cfm—85,000 btu output. 24x24x50 brown baked enamel cabinet. Cast iron tubular heat exchanger.

Oil Unit—1/40th hp motor. Removable and adjustable discharge grille. Removable panel for cold air return. Ball flame mechanical draft. Vaporizing oil burner with motor blower and constant level valve. 7/10 gph capacity. Propeller type fan, and any speed up to 600 cfm. Available for manual control or with electric head and thermostat. 70,000 btu output.—*The Kehm Corporation, 135 So. LaSalle St., Chicago.*

190—Tank Kleen

Celco Tank Kleen Formula No. 101, a new type of liquid fuel system cleaner, dissolves and eliminates formations of gums, tars, etc.

Tank Kleen works by reforming all soluble hydrocarbon binders into a liquid which burns with the fuel, while rendering free all insolubles into a colloidal suspension. It functions equally as well with oil, gasoline, kerosene or fuel oil systems.—*Dept. 101, Celco Corporation, 110 East 42nd St., New York 17, N.Y.*

191—Super Solders

A new series of Fusion Super Solders in paste form is announced. These chemical paste alloys contain the flux, cleaner, tinning agent and actual metallic solder complete. One operation cleans, tins, solders.

The solder paste can be applied automatically or by hand before soldering.

The series of Super Solders cover three distinct temperature ranges:

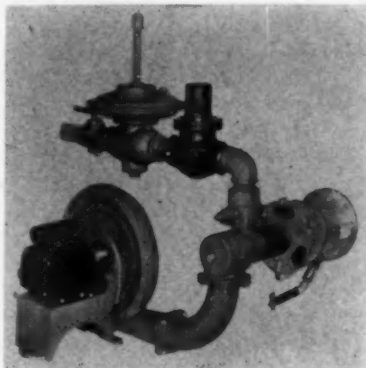
- 1—Low temperature alloys 200—500 deg. F
- 2—Medium temperature alloys 500—750 deg. F
- 3—Brazing alloys 1150—2000 deg. F

They are also separately compounded for each type of application or material such as electrical, sweated fittings, sheet metal, stainless steel, nickel chrome alloys, etc.—*Fusion Engineering, 1836 Euclid Ave., Cleveland 15.*

192—Pow-R-Semblers

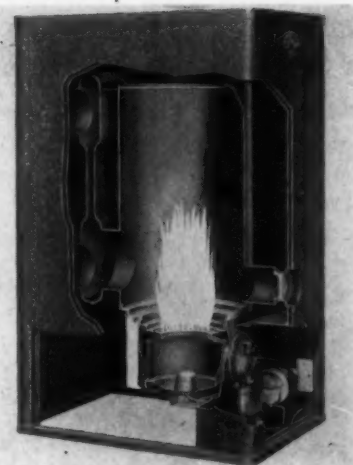
Pow-R-Semblers are complete pre-engineered gas combustion assemblies, adapted to firing air heaters, dryers, ovens, kilns, or wherever semi-open burners with controlled flames are desired. The assemblies combine air handling, gas supply, mixing and burning elements, normally built as single burner units.

Heart of the units is the new "Mixjector." Using air from a constant pressure blower, the Mixjector draws gas through a zero governor



in quantity required and supplies the mixture to the burner nozzle. The velocity of the flame draws in considerable secondary air which keeps the nozzle cool. A shutter on the back of the burner cage controls secondary air where a heavy draft is available.

Pow-R-Semblers are available in eight capacities, ranging from 400,000 Btu/h to 3,300,000 Btu/h. Each size is available in four variations of control.—*Industrial Div., Bryant Heater Co., 1020 London Rd., Cleveland 10.*



193—Thermaflow

The new Super Model 74 "Thermaflow" furnace, has been designed for small homes. Pilot and booster fires constitute the equivalent of one ordinary "on and off" furnace. Its coasting fire provides the potentialities of a second furnace, maintaining a steady flow of heat in the degree needed when the temperature demands are too great for pilot fire and too mild for booster.

With 3-stage heating there is fuel economy. There is no heat wasted in reheating the furnace and duct work of the "Thermaflow" because, with the coasting fire, they are always kept warm.

This Gravity model furnace is designed for basement installation. Its capacity is 60,000 Btu at the bonnet and it operates on Commercial Grade No 1 fuel oil or any other type of fuel oil whose gravity is not lower than 36.

The vital parts of the oil burner are made of stainless steel to insure long life. The casing parts are Bonderized to protect the baked enamel finish.—*Perfection Stove Company, 7609 Platt Ave., Cleveland 4.*

194—Tank Saver

Oil tanks fail because they rust through, and they rust through, not because of their contact with petroleum products, but because of moisture that collects due to condensation.

Inasmuch as Tank Saver is heavier than water, it goes to the bottom of the tank, mixes with the water and forms a protective film over any metal that the water touches.

Tank Saver is highly alkaline and neutralizes any acid that may be in the oil.—*Sudbury Laboratory, South Sudbury, Mass.*

EQUIPMENT DEVELOPMENTS

Use the Coupon on Page 134

195—Silver-Soldering Kit

A new silver-soldering outfit includes an improved type alcohol torch, fuel, heat retaining chamber, accessories, instructions for use, and a handy silver solder supply kit (a tube of flux paste and 100 inches of assorted sizes of silver solder wire and one-inch width strip sheet). The kit may also be used with an acetylene torch. It is packed in a self-contained permanent case and weighs 3 pounds.—*American Products Corporation, 800-19 Lowell Building, Chicago 5.*

196—Oil-fired Conditioner

The new Rheem Series 3601 oil-fired winter air conditioner is an efficient, economical and clean heating unit with outer cabinet of high quality cold rolled steel, attractively finished in baked enamel.

Two sizes are available. Dimensions of the first are 52 x 27 x 52 in. with a bonnet output of 106,000 Btu/hr., and 90,000 output Btu/hr. register. The second model is larger



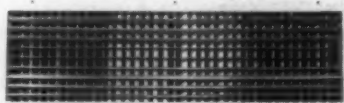
being 60 x 30 x 59 in. with output 153,000 Btu/hr. bonnet and register output of 130,000 Btu/hr.

Standard equipment includes combination fan and limit control, barometric draft control, lightweight insulating refractory combustion chamber, float-controlled automatic humidifier with Vapo-Glass evaporating segments. The oil burner is the pressure atomizing type complete with room thermostat and primary combustion control. The burner is flange mounted.—*Rheem Manufacturing Company, 570 Lexington Ave., New York 22.*

197—Grilles—Registers

A complete new line of air diffusion grilles and registers will feature the new Waterloo Airfoil Louvre. This Airfoil Louvre is patterned after the Airfoil section of an airplane.

Airfoil Louvres are standard on all supply grilles. A new matching



air grille and volume control damper can be furnished in any size without mullions or butted construction.

Blades are inserted and tensioned in frame with a new device which assures uniform tension and prevents possibilities of freezing or locking of adjustable louvers.

Catalog and data is available.—*Titus Manufacturing Corporation, P.O. Box 591, Waterloo, Iowa.*

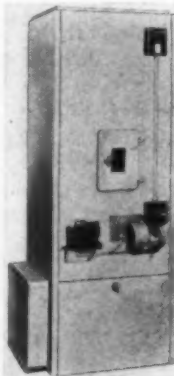
198—Oil Furnace

The Castle oil-fired winter air conditioning furnace—Model OF-60-UB—has a capacity of 61,220 Btu at the bonnet, is equipped with combination fan and limit switch, all burner controls, room thermostat with 25 feet of wire, draft regulator, filter and filter frame.

The vaporizing-type oil burner with blower motor, operating on only 16 watts, insures continuous and properly metered mechanical draft to the burner, whether on high or low fire. The pilot fire is low enough to preclude the possibility of overheating in mild weather.

Removable panels are provided on both sides and rear of the unit. The jacket is 20-ga. steel, of interlocking construction, with baked enamel finish inside and out. The combustion chamber—18 in. in diameter—is 16 ga. steel, seam welded with a 16-ga. stainless steel baffle installed in the drum to prevent dead spots.

Furnace height is 68½ in. and the casing size is 24 by 25½ in. Floor space required is 28 x 31. Approved by NBFU.—*Castle Industries Co., Inc., Old Nepperhan Ave., Yonkers 3, N. Y.*



199—Palmaire

A new Palmaire 80,000 Btu input suspended type gas-fired unit heater specifically designed for business and industrial heating is announced.

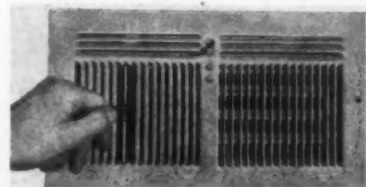
Outstanding features include a compact design to permit low ceiling installations, corrugated steel heating elements to increase heat transfer efficiency and reduce operation noises to a minimum, adjustable air deflectors, a slow speed heavy duty motor, choice of fan or blower and easily accessible controls and burners for inspection and adjustment. During the summer months the unit can be used as an air ventilator.

The Palmaire heater hangs from the ceiling permitting full use of space. The heater can be equipped with thermostatic control to provide automatic temperature regulation.

Palmaire unit heaters are fully AGA approved for natural, LPG or manufactured gas.—*The Palmer Manufacturing Corporation, 705 W. Jefferson, Phoenix, Ariz.*

200—Registers and Grilles

A new line of Atlas registers and grilles—sidewall and baseboard—with single valve, multivalve and no valve, are announced. Installa-



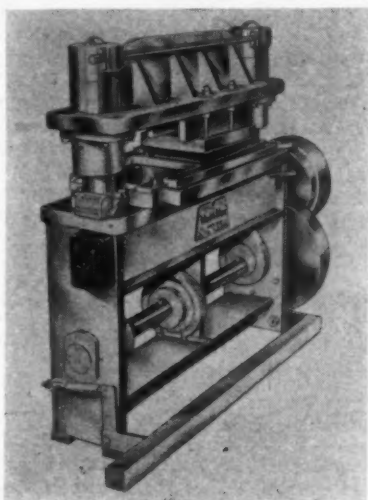
tion frames for sidewall and baseboard may be used with all Series 100, 200, 300 and 400. Panels louvred to specifications, using standard louver dies—3½, 5½, 7 and 9-in. long—are offered.—*J. B. Smith Co., 3327 "B" St., Philadelphia 34.*

EQUIPMENT DEVELOPMENTS

Use the Coupon on Page 134

201—Multi-Max Press

A 30-ton combination shear and press—the Multi-Max—has been designed by Harold Verson. Mechanically operated, it shears, blanks, notches, punches, perforates, slots, pierces, lances, bends and forms sheet metal parts in single or multiple units, with one operator. It needs no special foundation, has no overhanging parts



and requires 36 by 75-in. floor space. Shipping weight is approximately 3250 lbs.

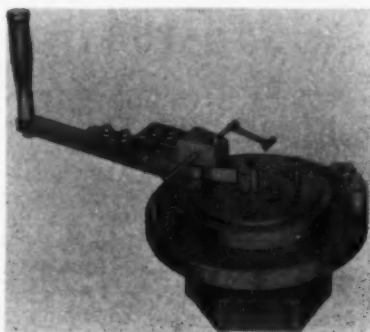
The Multi-Max is of all steel plate welded construction, normalized after welding to relieve all stresses. Stroke is 2 in., as is the ram adjustment. Shut height is 10 in. The stroke is down, the adjustment up. Bed die space is 12 x 36 in.; ram die space is 10 x 36 in. Bed opening, 5 x 32 in. A 1½ hp, 3 phase motor is furnished with each press, capable of producing 100 strokes per minute. Bed is 32 in. from floor, overall height is 57 in.—Parker Manufacturing Company, 2200 Colorado Ave., Santa Monica, Calif.

202—Smoke-Pipe Jacket

A smoke-pipe jacket has been patented (Patent No. 2,423,656) and is approved by the Department of Public Safety, City of Pittsburgh. This fire-protecting jacket can be applied to new as well as existing furnaces and stove pipes. There is also a draft control, a window flue panel, and an adjustable wall thimble.—J. H. Messer, 7240 Bennett St., Pittsburgh, Pa.

203—Di-Acro Bender

A DiAcro Bender No. 1A has been designed, capable of forming large radii in the light weight materials at a high rate. This new precision multi-purpose bending machine will form and duplicate an unlimited variety of parts and pieces on a



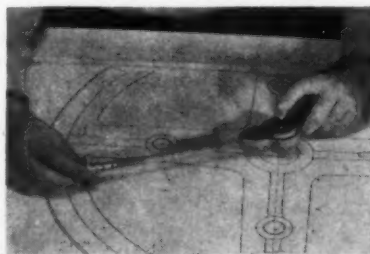
production basis. It will also create shapes and outlines. The range of contour forming covers all types of ductile materials such as round, half-round, hexagon and square rod, tubing, angle, channel, molding, strip stock and bus bar.

A large variety of conversions for all sizes of Di-Acro benders is available, which can be mounted on the machine for numerous specialized forming operations.—O'Neil-Irwin Manufacturing Company, Lake City, Minnesota.

204—Beam Compasses

A beam compass, featuring compactness and rapid, efficient radius setting, is being marketed.

The Omicron beam compass set was designed by a draftsman. Applying the principle of the flexible-rigid type of retractible steel tape,



instant radius settings up to 72 inches may be used. The tape retracts into a small, rugged die-cast case that may be held in the palm of the hand. A brake lever firmly locks the tape in any desired adjustment. Only when the lever is depressed may the tape be moved. The accurately machined head holds a standard drafting pencil lead or a steel scriber. It may also hold a common lead pencil.—The Omicron Company, 532 W. Windsor Road, Glendale 4, Calif.



205—Electric Erasing

A hollow shaft electric erasing machine holds a 7-inch revolving eraser firmly. Erasers may be inserted through either end of the hollow shaft. A draw ring on chuck holds eraser firmly in position.

A specially designed, induction type motor, plus a nose bearing mounted in rubber, assures smooth, quiet running and vibration-free service for the drafting room, or accounting department.—Charles Bruning Company, Inc., 4754 Montrose Ave., Chicago 41.

206—Solder-matic Attachment

A new "Solder-Matic" solder feeding attachment feeds solder smoothly at the touch of the fingertip. It clamps on to any standard electric soldering iron.

By feeding exactly the amount of solder needed, at the right time and



place, the "Solder-Matic" eliminates molten solder drippage and improves quality of workmanship. One hand is free for other work.

Solder in short lengths, in small coils, or fed from a spool as large as 25 lb., can be handled by the new "Solder-Matic." It takes solder from 1/16 to 3/16 in. in diameter, and feeds up to 3/16 in. per stroke. Screw adjustment of the stainless steel nozzle guides solder exactly where needed. Liberal use of lightening holes in the "Solder-Matic" cuts weight and assures cool operation.—Nelpin Manufacturing Company, 45-17 Davis St., Long Island City 1, New York.

1946-1947

	Page		Page
Advertising, Selling, Display		Aluminum	
Dollars and Cents Price Ceilings May Come	Jan. 46 110	Aluminum—Airplanes to Air Conditioning, by Lawrence E. Gichner	May 46 71
How Much? The 64 Dollar Question in Blower Sales	Jan. 46 128	Surface Preparation of Aluminum Alloys, by Wm. P. Brotherton. Part 1—Introduction and Mechanical Cleaning	July 46 82
Formula for Extending the Acceptance of Warm Air Heating, by Robert K. Thulman	Jan. 46 142	Part 2—Chemical Cleaning	Aug. 46 77
It's Time to SELL Again! by J. A. Kiss..	Feb. 46 63	Aluminum Production	Nov. 46 65
First Steps to Sales Control, by Arthur Roberts	Mar. 46 58	Aluminum Ducts (Cronstrom & Waterbury)	Jan. 47 123
Suggested Arrangement for a Heating Dealer's Office and Shop, by E. E. Zideck	Mar. 46 59	Aluminum in Large Pipes for a Clay Pipe Drying System, by W. H. C. Ness ...	June 47 83
Organizing an Appliance Business, by R. C. Nason	Mar. 46 74	Aluminum Warning	July 47 62
Have Sales Meetings—Not Bull Sessions! by J. A. Kiss.....	June 46 44	Aluminum—for Large Ducts	Aug. 47 83
Sales Prospect—Handle with Care! by J. A. Kiss	Oct. 46 60	FHA Approves Aluminum for Ducts ...	Dec. 47 70
Systematize Your Sales, by Arthur Roberts	July 46 50	Welding Aluminum in Heavy Gauges ..	Dec. 47 102
Sales Control and Analysis, by Arthur Roberts	Aug. 46 56	Apprenticeship	
Schmidlin's—Adjusts Itself to Circumstances	Jan. 47 112	Needed Immediately—5000 Apprentices	Jan. 46 106
Quality of Installation Keynotes Contractors' Success—Arno H. Gerdson, Cincinnati	June 47 68	The Chicago Plan for G.I. Apprentices, by James D. Ryan	Jan. 46 108
Automatic Selling Expands (Vending Machines)	July 47 72	Are We Doing a Poor Job on Apprentices (E)	Mar. 46 53
Ten Commandments of Successful Salesmanship, by Arthur Roberts	Aug. 47 64	A Suggested "In-Shop" Training Program for GIs	Apr. 46 55
Let the Postman Ring Your Sales Bell, by David Markstein	Nov. 47 73	Apprentices in Chicago	May 46 74
Business the Year Around	Dec. 47 84	Apprentice Progress Reported	June 46 45
Air Conditioning—Houses		New GI Training Ceiling	Sept. 46 55
Radiant Heating System in Which the "Panel" is Heated by a Warm Air Blanket, by F. E. Giesecke	Jan. 46 123	Public Law 679 (Veterans)	Oct. 46 56
Evaporative Cooling, by M. E. Marsalis (Part 1)	Jan. 46 139	Training Course Survey	Nov. 46 87
(Part 2)	Feb. 46 73	Apprentice Wages Too Low	Dec. 46 74
(Part 3)	Mar. 46 71	New Sheet Metal Apprentice Standards of The Sheet Metal Workers International Assn.	Jan. 47 116
Airstream Heating Systems	June 46 49	Move to Restore Veterans Former Wage Scale	Jan. 47 228
Electronic Devices Produce Pure Air ...	Sept. 47 71	May Up Job Training Allowances	Jan. 47 232
Air Conditioning—Large Buildings		More Joint Apprentice Committees Are Needed for the Construction Program, by Maurice M. Hanson, Asst. Mgr. App. Tr. Ser., U. S. Dept. Labor	Feb. 47 71
Air Conditioning and Ventilating Systems to Safeguard Health and Comfort of Workers, by E. E. Herbacek	Mar. 46 67	More Apprentices, Yes, by H. R. Bostrom	Apr. 47 62
Complete Air Conditioning for a Clinic .	May 46 66	Eighty Thousand Learners	June 47 55
Commercial Air Conditioning	June 47 56	Apprentice Training	Sept. 47 68
Comfort Cooling a Beauty Salon, by R. C. Nason	Aug. 47 71	G.I. Sheet Metal Workers	Sept. 47 68
Air Handling		Rochester Apprentice Standards for Open Shops	Dec. 47 74
Laundry Takes to the Air! by R. C. Nason	Mar. 47 99	Association Activities	
		Sheet Metal Contractors' Nat'l Ass'n Reports	Jan. 46 113
		Nat'l Warm Air Heating Ass'n Reports ..	Jan. 46 116
		NWAH&ACA Annual Meeting	Jan. 46 174
		Carolinas' Conference	Jan. 46 178
		The Indiana State Convention	Feb. 46 101
		The Wisconsin State Convention	Feb. 46 105
		Iowa Contractors Form State Association	Feb. 46 57
		Oil Heating Convention and Exposition .	Mar. 46 54
		Iowa Launches State Association	Mar. 46 85
		Sheet Steel Distributor Meeting	Mar. 46 95
		The Michigan Convention	Mar. 46 97
		Ohio State Convention	Apr. 46 90

New Ydrk State Convention	Apr. 46	93
Sheet Metal Contractors' Nat'l Ass'n Convention	May 46	81
Oil Heat Institute's Exposition and Convention	May 46	90
Iowa Contractors Form State Ass'n	May 46	92
Illinois State Convention	May 46	94
The Carolinas Convention	June 46	83
New Research Residence	July 46	59
National Warm Air Ass'n June Meeting ..	July 46	87
Sheet Steel Distributors 36th Semi-Annual	Nov. 46	69
January Brings Convention of Industry ..	Dec. 46	80
Show Section (NWAH&ACA)	Dec. 46	91-106
National Warm Air Heating & Air Conditioning Ass'n, by Frank E. Mehrings, President	Jan. 47	115
Sheet Metal Contractors' National Ass'n, by Patrick S. Varden	Jan. 47	119
Brief Summary of Some of the Interesting Displays at the Exposition	Feb. 47	72
NWAH&ACA Cleveland Convention ... (Exposition Highlights)	Mar. 47	113
The Indiana Convention	Mar. 47	117
The Wisconsin Convention	Mar. 47	120
The Michigan Convention	Apr. 47	91
The Ohio Convention	Apr. 47	94
The Illinois Convention	Apr. 47	98
Annual Convention of SMCNA	May 47	89
New York Convention	May 47	95
National Association of Sheet Metal Distributors Spring Meeting	June 47	87
National Warm Air Heating & Air Conditioning Association June Meeting ..	July 47	97
The Florida Convention	July 47	102
The Carolinas' Annual	Aug. 47	97
SMCNA Labor Relations Committee Meets	Sept. 47	103
34th NWAH&ACA Convention	Nov. 47	72
Manual No. 9 Available (NWAH&ACA) ..	Nov. 47	72
Eighth International Exposition—ASH&VE	Nov. 47	78

Authors

Algren, Axel B.	Jan. 47	141
Bates, John R.	Nov. 46	80
Benn, C. L.	Oct. 47	76
Biddle, N. J.	June 46	46
Bostrom, H. R.	Apr. 47	62
Bradley, Gen. Omar N.	Apr. 46	56
Brandt, Allen D.	May 47	79
Brotherton, William P.	Feb. 46 85; Mar. 46 81; July 46 82; Aug. 46 77; Jan. 47 163; June 47 75; Nov. 47 106	
Brown, A. W.	Oct. 47	79
Buck, George B.	Sept. 47	64
Campbell, E. K.	Mar. 47	94
Clark, L. V.	Oct. 46	74
Crandall, A. C.	Sept. 47	80
Dill, Richard S.	Jan. 46 132; Feb. 46 77	
Dingman, Stanley T.	Jan. 46 153; Feb. 46 89	
Dingman, Stanley T.	Jan. 47 159; Aug. 47 93	
Foy, Norman W.	Mar. 46	95
Fuller, E. F.	Mar. 46 76; June 46 56; Sept. 46 66	
Gichner, Lawrence E.	Apr. 46 77; May 46 71; Aug. 46 82	
Giesecke, F. E.	Jan. 46	123
Gillespie, Howard C.	Feb. 47	64
Goergen-Machwirth	Aug. 47	86
Hanson, Maurice M.	Feb. 47	71
Harner, J. P.	Jan. 46 170; Feb. 46 96; Apr. 46 80	
Harner, J. P.	July 47 60; Aug. 47 62	
Herbacek, E. E.	Mar. 46	67
Hill, J. Bennet	Nov. 46	80
Holden, Thomas S.	July 47	64
Howe, Frank B.	Oct. 46	82
Jacobs, Fred B.	Apr. 46	86

James, Eugene E.	Jan. 46	161
Kiss, J. Archer.	Feb. 46 63; June 46 44; Oct. 46 60	
Konzo, S.	Jan. 46 145; Feb. 46 69; Apr. 46 69; June 46 61; July 46 63; Aug. 46 71; Sept. 46 68; Oct. 46 68	
Konzo, S.	Nov. 47	81
Kruckman, Arnold.	Jan. 46 114; Feb. 46 54; Mar. 46 56; Apr. 46 48; May 46 52; June 46 42; July 46 52; Aug. 46 54; Sept. 46 50; Oct. 46 58; Nov. 46 62; Dec. 46 72; Jan. 47 110; Feb. 47 62; Mar. 47 76; Apr. 47 58; May 47 58; June 47 52; July 47 58; Aug. 47 60; Sept. 47 60; Oct. 47 60; Nov. 47 70; Dec. 47 68	
Kugler, Arthur N.	Sept. 46 73; Nov. 46 85; Dec. 46 111	
Landau, Mitchell	Feb. 47	84
Mannen, D. E., Jr.	Aug. 47	87
Markstein, David	Nov. 47	73
Marsalis, Martin E.	Jan. 46 139; Feb. 46 73; Mar. 46 71; May 46 62; June 46 53; Apr. 47 69; May 47 67; June 47 66	
Marshall, G. K.	Aug. 47	73
Mehrings, Frank E.	Jan. 47	115
Mirabile, J. J.	July 46 66; Sept. 46 59; Nov. 46 73; Feb. 47 80; Mar. 47 85; Apr. 47 70; July 47 74; Sept. 47 75; Oct. 47 71; Dec. 47 81	
Narowitz, Louis L.	Jan. 47 120; Nov. 47 110	
Nason, R. C.	Feb. 46 94; Mar. 46 74; June 46 69; Aug. 46 66; Sept. 46 80; Dec. 46 117; Jan. 47 153; Mar. 47 99; Aug. 47 71; Sept. 47 84; Oct. 47 74; Nov. 47 97; Nov. 47 106; Dec. 47 79	
Neubecker, William	Jan. 46 156; Apr. 46 84; June 46 72; Sept. 46 63; Oct. 46 72; Mar. 47 92; Apr. 47 82; July 47 86; Sept. 47 92; Oct. 47 80; Nov. 47 105; Dec. 47 86	
Nichols, H. M.	Sept. 47 94; Oct. 47 88; Nov. 47 103; Dec. 47 99	
Otten, H. J.	Aug. 47	83
Peterson, John E.	Nov. 46 76; Dec. 46 83; Apr. 47 74; June 47 61	
Pew, Arthur E., Jr.	Nov. 46	80
Roberts, Arthur	Jan. 46 117; Feb. 46 56; Mar. 46 58; July 46 50; Aug. 46 56; Nov. 46 66; Jan. 47 105; Mar. 47 80; May 47 62; Aug. 47 64; Sept. 47 62; Nov. 47 77; Dec. 47 71	
Robinson, H. C.	Jan. 46 132; Feb. 46 77	
Robinson, Wm. C.	Jan. 46 132; Feb. 46 77	
Roose, Robert W.	Nov. 47	94
Root, E. B.	Nov. 47 90; Dec. 47 89	
Rudolph, Walter	Dec. 47	95
Ryan, James D.	Jan. 46	108
Schmitt, Wm. J.	Aug. 47	84
Sullivan, William A.	Aug. 46	69
Tucker, Raymond R.	June 46	64
Varden, Patrick S.	Jan. 47	119
White, Howard D.	Dec. 47	109
Wilson, Warren E.	May 47	69
Woodward, F. R.	Oct. 46	86
Zideck, Ernest E.	Jan. 46 164; Feb. 46 59; Mar. 46 86; May 46 75; June 46 78; July 46 78; Sept. 46 76; Nov. 46 88; Jan. 47 171; Feb. 47 97; Mar. 47 107; Apr. 47 86; June 47 79; July 47 89; Sept. 47 97; Oct. 47 90; Nov. 47 99; Dec. 47 103	
Zornes, K. R.	May 47	73

Balancing An Air Conditioning System

How to Adjust and Balance a System, by S. Konzo	Sept. 46	68
---	----------	----

Blowers

How Much? The \$64 Question in Blower Sales	Jan. 46	128
Blower Manufacturers Launch Research Project	Feb. 47	67

Bookkeeping and Cost Accounting

1946 Tax Economies, by Arthur Roberts	Jan. 46	117
Partnership or Corporation—Part 4....	Jan. 46	119
Watch Working Capital—Now! by Arthur Roberts	Feb. 46	56
First Steps to Sales Control, by Arthur Roberts	Mar. 46	58
Partnership or Corporation—Part 5....	Mar. 46	60
Quick Picture of Overhead—N. J. Biddle	June 46	46
Now Is the Time to Study Your Profit Structure (E)	July 46	49
Systematize Your Sales, by Arthur Roberts	July 46	50
Don't Ignore Wage Records	July 46	51
Sales Control and Analysis, by Arthur Roberts	Aug. 46	56
Correct Practice in Oil Heating (Work in Progress) by J. J. Mirabile	Sept. 46	59
Get It While They've Got It! by Arthur Roberts	Nov. 46	66
Family Partnership Decision	Dec. 46	74
Is "Price Cutting" Wise?	Dec. 46	76
How to Reduce Payroll Taxes Under Merit Rating Part 1—Research Institute of America, Inc.	Dec. 46	78
Tax Calendar	Jan. 47	104
The Tax Picture—1947, by Arthur Roberts	Jan. 47	105
Treasury Allows Increased Depreciation	Jan. 47	106
How to Reduce Payroll Taxes Under Merit Rating Part 2—Research Institute of America, Inc.	Jan. 47	107
Payroll Tax Disqualifications from page 107	Jan. 47	108
Undistributed Corporate Earnings	Jan. 47	177
Examine Your Cash Discounts	Jan. 47	228
Organizing Sub-corporations	Jan. 47	232
Tax Cuts Expected	Jan. 47	234
Social Club Dues Deductible	Jan. 47	234
How to Reduce Payroll Taxes Under Merit Rating Part 3—Research Institute of America	Feb. 47	68
How to Reduce Payroll Taxes Under Merit Rating	Mar. 47	78
Build Profits—By Sharing Them! by Arthur Roberts	Mar. 47	80
Cut Your Price—Not Your Throat, by Arthur Roberts	May 47	62
Budgets—First Aid to Profits, by Arthur Roberts	Sept. 47	62
Are Profit Sharing Plans a Substitute for Pensions, by Geo. B. Buck	Sept. 47	64
Bank Credit Is Being Modernized, by Arthur Roberts	Nov. 47	77
Partnership and Your Income Tax, by Arthur Roberts	Dec. 47	71

Chimneys

The ABC's of Combustion	Aug. 46	63
Back-Draft and Condensation, by L. V. Clark	Oct. 46	74

Coal

Liquid Fuel from Coal	July 46	62
Bituminous Coal Research	July 46	90
Stoker Coal Prospects	Sept. 46	124
Coal Production Statistics	Oct. 47	67

Code and Manual, by S. Konzo

Equivalent Lengths of Registers	Jan. 46	145
Sizing the Branch Ducts	Feb. 46	69
How Tables 8 and 9 Were Established	Apr. 46	69
Sizing Return Air Ducts	June 46	61
Trunk Duct and Bonnet Construction	July 46	63
Sizing of Trunk Ducts	Aug. 46	71
How to Adjust and Balance a Warm Air Winter Air Conditioning System	Sept. 46	68

Codes—Ordinances—Licensing

A Gravity Heating Code in Ordinance Form	Apr. 46	63
International Labor Organization Ventilation Code	May 47	98
Introduction to Manual 9—W. R. Redrup	June 47	54
Attic Ventilation Code	June 47	71
Horse and Buggy Building Codes	Sept. 47	66
Manual No. 9 Available	Nov. 47	72

Combustion

The ABC'S of Combustion	May 46	64
The ABC'S of Combustion	June 46	58
The ABC'S of Combustion	July 46	70
The ABC'S of Combustion	Aug. 46	63
Combustion Air Supply Grille Recommended for Conditioners and Furnaces in Confined Spaces	July 46	72

Controls

New "Stoker-Pilot" Sees the Flame	Nov. 46	82
Finger-Tip Climate Control, by R. C. Nason	Sept. 47	84

Conversion—House Heating

Supply Risers in Outside Chimney	Apr. 46	67
----------------------------------	---------	----

Cooling—Evaporative

Evaporative Cooling by M. E. Marsalis		
Part 1	Jan. 46	139
Part 2	Feb. 46	73
Part 3	Mar. 46	71
Part 4	May 46	62
Part 5	June 46	53
The Case of the Sick (Hot!) House, by Martin E. Marsalis	Apr. 47	69
"Stucco's" Are Responsible for Most of Our Evaporative Cooling "Skeletons," by Martin E. Marsalis	May 47	67
"If It Had Been a Snake—It Would Have Bitten You," by Martin E. Marsalis	June 47	66
Attic Ventilation Code—Prop. Fan Mfrs. Assn.	June 47	71
Time Lag in House Heat Gain or Loss		
May Permit Use of Under-Sized Cooling Units	July 47	69

Copper

Copper for Housing	Aug. 46	120
Greater Copper Supply	Sept. 46	126
Copper Outlook	June 47	55

Drying

Oven Fire Stop System	Feb. 46	88
Hay Drying—The Modern Way	June 46	75
Aluminum in Large Pipe for a Clay Pipe Drying System	June 47	83

Duct Construction

Aluminum—Airplanes to Air Conditioning, by L. E. Giehner	May 46	71
Trunk Duct and Bonnet Construction, S. Konzo	July 46	62
Sizing of Trunk Ducts, by S. Konzo	Aug. 46	71
Aluminum Ducts (Cronstrom)	Jan. 47	123
Pipe and Duct Sizing Charts for Cfms from 30 to 80,000—Part I	Mar. 47	103
Part II	Apr. 47	80
Part III	May 47	85
FHA Approves Aluminum for Ducts	Dec. 47	70
Insulation for Air Conditioning Ducts	Dec. 47	79

Ducts—Clay Tile

Solar House—Heated by a Warm Air Floor Panel, by John E. Peterson (hollow red tiles)	Dec. 46	83
--	---------	----

Dust Collection

Collection Systems for Stand Grinders ..	Jan. 46	168
Control of Abrasive Dust, by Fred B. Jacobs	Apr. 46	86
Pull-Through Dust Collector	Feb. 47	93
Laundry Takes to the Air! by R. C. Nason ..	Mar. 47	99
Design of Waste Removal System—Part I, by H. M. Nichols	Sept. 47	94
Part 2	Oct. 47	88
Part 3	Nov. 47	103

Education

Purdue Offers "Practical" Engineering Course, by Howard C. Gillespie	Feb. 47	64
Warm Air "Short Course"	May 47	94

Electric Heating

Electric Heating (Electromode)	Jan. 47	132
Electric Radiant Heating	Oct. 47	68

Engineering Design Data

Heat Losses from Floors Laid on the Ground, by Dill, Robinson, Robinson ..	Jan. 46	132
Formula for Extending the Acceptance of Warm Air Heating, by Robert K. Thulman	Jan. 46	142
Equivalent Length of Registers, by S. Konzo	Jan. 46	145
Sizing the Branch Ducts, by S. Konzo ..	Feb. 46	69
Heat Losses from Floors Laid on the Ground, Part 2, by Dill, Robinson, Robinson	Feb. 46	77
Supply Risers in Outside Chimney	Apr. 46	67
How Tables 8 and 9 Were Established ..	Apr. 46	69
Heating with Infra Red	May 46	61
Catalytic Heating Oils	May 46	61
Venting Gas-Fired Heaters	May 46	61
Panel Heating Under Wood Floors	May 46	61
Sizing Return Air Ducts	June 46	61
Trunk Duct and Bonnet Construction ..	July 46	63
Combustion Air Supply Grille Recommended for Conditioners and Furnaces in Confined Spaces	July 46	72
Sizing of Trunk Ducts	Aug. 46	71
How to Adjust and Balance a Warm Air Winter Air Conditioning System	Sept. 46	68
Back Draft and Condensation, by L. V. Clark	Oct. 46	74
Simplified Btu Method for Estimating Heat Losses of Average Residences, by Mitchel Landau	Feb. 47	84
Pipe and Dust Sizing Charts for Cfms from 30 to 80,000—Flanigan, Wm. P. ..	Mar. 47	103
Part II	Apr. 47	80
Part III	May 47	85
Time Lag in House Heat Gain or Loss May Permit Use of Under-Sized Cooling Units	July 47	69
Those Famous Seven Steps—NWAH&ACA	Aug. 47	72
Current Developments in Air Conditioning, by G. K. Marshall	Aug. 47	73
Gravity System with Air Filters	Oct. 47	82
Manual No. 9 Available	Nov. 47	72
Five Checks for Comfort Dividends, by S. Konzo	Nov. 47	81
Ductwork Estimating Tables, by E. B. Root	Nov. 47	90
1927-FWA ... 1947-CAC	Dec. 47	67
Opposes Open Return Air	Dec. 47	85

Estimating

Furnace Installation Time-Table	Apr. 47	73	
Ductwork Estimating Tables, by E. B. Root	Nov. 47	90; Dec. 47	89

FHA—NHA

Emergency Repairs	Nov. 46	64
Housing Still the Big Issue, by Arnold Kruckman	Dec. 46	72
Housing Problems	Dec. 46	75
Housing Program Called Failure	Dec. 46	162
New Housing Rules	Jan. 47	140
FHA Reports on House Insulation and Basementless Houses	Feb. 47	83

Fabrication

Round Elbows of Welded Construction, by J. P. Harner, Part 1	Jan. 46	170
Part 2	Feb. 46	96
Part 3	Apr. 46	80
"Pancake" Dies Save Time, by Eugene E. James	Jan. 46	161
Chimney Cap for Arched and Corrugated Roof	Feb. 46	92
Pre-Fabricated-Metal-Building	Feb. 46	94
Neilson Demands Imagination, by R. C. Nason	June 46	69
Bell and Bennington Specialize in Heavy Industrial Work	July 46	75
"Put a Crimp In It"	Aug. 46	81
Air Hammers Speed Up Seam Closing, by R. C. Nason	Sept. 46	80
Contour Forming by Stretching, by Frank B. Howe	Oct. 46	82
Stainless Steel Sinks—Custom Made ...	Dec. 46	114
Machinery Worth Quarter-Million Builds Buse's Ship Outfitting Reputation, by R. C. Nason	Jan. 47	153
The ABC's of Metal Properties	Jan. 47	167
Expansion and Contraction of Metals ...	Feb. 47	89
Machine Bases of Welded Plate	Feb. 47	94
Sheet Delivery in Rolls—Is It Practical, by E. E. Zideck	Apr. 47	86
Jigging for Better Welds (Part 1)	July 47	83
Production by Departments Aids Sheet Metal Fabricator, by R. C. Nason	Nov. 47	97
Corner Rounding	Nov. 47	106
Gas Lamp Replicas	Nov. 47	145
Unusual Sheet Metal Work A Specialty, by Walter Rudolph	Dec. 47	95

Fabrication—Jigs and Fixtures

"Pancake" Dies Save Time, by Eugene E. James	Jan. 46	161
Jigs and Fixtures for Sheet Metal Welding, Part 1, by Arthur N. Kugler	Sept. 46	73
Part 2	Nov. 46	85
Part 3	Dec. 46	111

Fabrication—Press Brake, by E. E. Zideck

Getting the Most Out of Your Press Brake:		
Pressures Required to Form Press Brake Bends	Jan. 46	164
Box Construction in the Press Brake ...	Mar. 46	86
Press Brake Work on Pans and Boxes ..	May 46	75
"Spring Back" in Metal Forming	June 46	78
Punching, Curved Shearing, Blanking, Notching in Press Brake	July 46	78
Forming Sheet Metal for Hollow Beads and Wire-Inlaving	Sept. 46	76
Forming of Sheet Metal in Rubber	Nov. 46	88
Use of "KirkSITE" in Dies	Jan. 47	171
Stamping and Flanging	Feb. 47	97
Tube Forming by Die-Sets	Mar. 47	107

Fabrication—Sheet Metal

Aluminum—Airplanes to Air Conditioning, by Lawrence Gichner	May 46	71
Surface Preparation of Aluminum Alloys, Part 1—Introduction and Mechanical Cleaning, by Wm. P. Brotherton	July 46	82
Part II—Chemical Cleaning	Aug. 46	77
Short on Profit?—Try Stainless, by L. E. Gichner	Aug. 46	82

Fabrication of Stainless Steel

Fabrication of Stainless Steel, by Wm. P. Brotherton, Part I	Feb. 46	85
Part II	Mar. 46	81
Part III	Apr. 46	80

Filters

Electronic Devices Produce Pure Air ...	Sept. 47	71
Profit Possibilities in Filter Service, by R. C. Nason	Oct. 47	74
Bacterial Removal by Air Filters, by A. W. Brown	Oct. 47	79

Fuel Conservation

Fuel Savings Effected by Insulation and Other Weatherproofing Means—from "House Insulation," U. S. Dep't of Commerce	Feb. 46	81
The ABC's of Combustion	May 46	64
The ABC's of Combustion	June 46	58
The ABC's of Combustion	July 46	70
The ABC's of Combustion	Aug. 46	63
Reduction in Fuel Bill with Storm Sash and Insulation (Small Homes Council)	Sept. 46	64
Save Fuel by Survey! by E. F. Fuller ...	Sept. 46	66

Fume Removal

Air Conditioning and Ventilation Systems to Safeguard Health and Comfort of Workers, by E. E. Herbacek	Mar. 46	67
Electronic Cleaning of Welding Fumes ..	Mar. 46	90
Laundry Takes to the Air! by R. C. Nason ..	Mar. 47	99
Modern Industry Depends on Exhaust Systems, by Wm. P. Brotherton	June 47	75
Design of Waste Removal Systems (Part 1) by H. M. Nichols	Sept. 47	94
(Part 2)	Oct. 47	88

Furnace Cleaning

One Way to Build a Truck-Mounted Furnace Cleaner	Mar. 47	73
Furnace Cleaner	Sept. 47	96

Furnace Production

1946 Warm Air Furnace Production ...	Apr. 47	67
1947—First Quarter Production	May 47	64
Warm Air Furnace Shipments—1st Quarter	July 47	62
Warm Air Furnace Shipments—May, 1947	Aug. 47	66
Warm Air Furnace Shipments—June, 1947	Sept. 47	67
Warm Air Furnace Shipments—July, 1947	Oct. 47	67
August Furnace Shipments	Nov. 47	72

Gas Heating

Natural Gas Supplies	Mar. 46	64
New AGA Requirements	May 46	57
Venting Gas-Fired Heaters	May 46	61
Gas Use Increases	July 46	56
Gas Heating Problems	July 46	62
Gas Furnaces and Conversion Burners Dominate AGA's 1946 Exhibit	Nov. 46	70
Gas Heating (Liquid Petroleum)	Jan. 47	133
Gas Conversion Burner Standards Are Needed to Protect Industry and Public ..	Jan. 47	135
N.Y.M.S.M.C. Standards for Manufactured Gas	Jan. 47	136
New Distillate Fuel Supply	Jan. 47	162
AGA Report of Natural Gas Reserves ..	Feb. 47	79
Service Suggestions for Gas Furnace Burners	Mar. 47	96
Gas Restriction Ruling	May 47	64
Gas Sales Rise in May	July 47	63
Gas Heats Dallas' Wynnewood Homes ..	July 47	73
Gas Sales Rise Sharply	Aug. 47	66
AA Survey of Gas Situation	Aug. 47	69

Minimum Specifications for the Installation of Gas-Fired Heating Equipment

(Part 1)	Aug. 47	78
(Part 2)	Sept. 47	78
A. G. A. Gas Heating Forecast	Oct. 47	68
Solving the Problems of Gas Heat, by C. L. Benn	Oct. 47	76
California Gas Supply Increasing	Dec. 47	70
Gas Sales Gain in September	Dec. 47	70

General Business

Quick Picture of 1946	Jan. 46	101
NWAH&ACA Reports	Jan. 46	116
Business Needs a New Program	Feb. 46	53
Ten Years of Social Security	Feb. 46	62
Wage Premiums Ruling	Feb. 46	65
Wet Heat Shortages	Feb. 46	66
GI's Benefits Broadened	Feb. 46	66
Plan for Industrial Peace	Feb. 46	66
How to Get Homes	Feb. 46	82
Housing Shortages	Feb. 46	91
Are We Doing a Poor Job on Apprentices? (E)	Mar. 46	53
Misleading Pre-Fab Ads	Mar. 46	55
Federal Construction Deferred	Mar. 46	59
The Wyatt Program	Mar. 46	63
Building Materials Report	Mar. 46	63
Wage Patterns	Mar. 46	64
75,000 Units for Reuse	Mar. 46	64
Home Building Costs	Mar. 46	75
HH Ratings Still Good	Mar. 46	78
VHP—No. 1 Does Not Put You Out of Business (E)	Apr. 46	47
Veteran Housing Program Order No. 1 ..	Apr. 46	50
Surplus Machinery	Apr. 46	59
Letter to CPA	Apr. 46	59
Unionizing Foremen	Apr. 46	59
Subsidies—Pro and Con	Apr. 46	60
Family Partnerships	Apr. 46	60
Government's Bite	Apr. 46	60
Our Material and Cost Problem (E)	May 46	49
The Seattle Wage Agreement	May 46	54
Why Production Lags	May 46	58
Construction Wages (Ex. Order 9697) ..	May 46	58
Would Prices Rise? (Nat'l. Assn. of Mfrs.)	May 46	58
June Status of Veterans Housing Program (E)	June 46	37
Temporary Housingalters	June 46	41
Some Basic Housing Facts	June 46	48
Illinois Professional Engineering Act ..	June 46	50
Our National Budget	June 46	60
Contract Settlement Near Finish (Off. of Contract Settlement)	June 46	66
Veterans Choice of Schooling	June 46	77
Approve 400,000 Dwelling Units	June 46	77
Study Your Profit Structure (E)	July 46	49
Don't Ignore Wage Records	July 46	51
Steel Production	July 46	55
Scarce Products	July 46	55
VHP Pattern	July 46	55
Pig Iron May Be Controlled	July 46	55
Scarce Materials	July 46	56
Labor Requirements	July 46	56
Federal Spending	July 46	56
No Tax Reductions	July 46	56
Our New Research Residence	July 46	59
A. C. at \$1.27 per room	July 46	62
What Vets Can Pay	July 46	116
Obsolete Building Codes	July 46	116
Insurance Liability	July 46	116
Insulation Board Shortage	July 46	118
Committed Construction Approved	July 46	118
Veterans Advisory Council	July 46	120
Need Housing Conversions	July 46	120
Plumbing Gets HH Rating	July 46	122
Real Estate Inflation	July 46	122
Building Prices to Rise	July 46	124

Who's Spending What	July 46	124
Stainless Price Raise	July 46	126
Production Is the Only Way to Stop Inflation (E)	Aug. 46	53
Iron Lungs to Fight Polio	Aug. 46	58
Check These Wage Rulings	Aug. 46	59
Warm Air Furnace Production	Aug. 46	59
Pay Only Authorized Wages	Aug. 46	59
Stoker Status	Aug. 46	60
Inventory Limitations	Aug. 46	60
Roofing Production	Aug. 46	60
Materials Production	Aug. 46	60
More HH Products	Aug. 46	116
No Strikes in Housing	Aug. 46	116
CC Ratings Restores	Aug. 46	116
Washington Gossip	Aug. 46	118
Short on Profit?—Try Stainless! by L. E. Gichner	Aug. 46	82
Experience with Profit-Sharing	Sept. 46	52
Hobbs Act Comment	Sept. 46	54
New Trends in Furnaces	Sept. 46	56
Oil Burner Fires Increasing	Sept. 46	56
Building Volume	Sept. 46	56
Latest Interpretation of "Set-Aside" Order (E)	Oct. 46	55
Furnace Production	Oct. 46	56
Public Law 679 (Veterans)	Oct. 46	56
Asphalt Roofing and Siding	Oct. 46	56
Presses and Press Brakes	Oct. 46	56
Heating Trends	Oct. 46	56
Factory-Built Homes	Oct. 46	56
The Parable of the Rotten Apples	Oct. 46	61
"At the crossroads" (Reconversion Progress)	Oct. 46	62
Melting Points of Metals and Alloys	Oct. 46	84
Some Things to Watch for in the Next 60 Days (E)	Nov. 46	61
Unit Air Conditioners Awarded Our Trade	Nov. 46	64
Watch Your Tax Reports	Nov. 46	64
End of Price Inflation in 1947	Nov. 46	65
Purchases and Income	Nov. 46	65
No Trend from Basements	Nov. 46	65
Surplus Welding Equipment	Nov. 46	65
1946-1947	Dec. 46	71
Chicago Wage Increases	Dec. 46	74
Partly Finished Inventories	Dec. 46	75
Wage Violations	Dec. 46	75
Another Prefabricator	Dec. 46	75
Water in Order Books	Dec. 46	75
How to Reduce Payroll Taxes Under Merit Rating, Part 1, Research Institute of America, Inc.	Dec. 46	78
Sheet Metal Shop—Bronx Office—Wall St., by R. C. Nason	Dec. 46	117
Quick Look at 1946—AA's Guess for 1947	Jan. 47	101
Schmidlin's—Adjusts Itself to Circumstances	Jan. 47	112
Industry Must Maintain Our Jurisdiction, by Louis L. Narowetz	Jan. 47	120
Set-Aside Order Revoked (Schedule B, PR 33)	Jan. 47	140
May Go Slow on Wage Increases	Jan. 47	230
Five-Day Week	Jan. 47	230
Wage Controls Abandoned	Jan. 47	230
Health and Welfare Plans	Jan. 47	230
The "Recession"—When—How Big?	Jan. 47	232
One in Every Seven	Jan. 47	234
New Veterans Hospitals	Jan. 47	234
The New Lanham Act (trademark)	Jan. 47	260
Non-Ferrous Supplies	Jan. 47	264
Black and Galvanized Sheet Situation (E)	Feb. 47	61
Blower-Manufacturers Launch Research Project	Feb. 47	67
Tin is Still Hard to Get	Feb. 47	67
1946 Building Review	Feb. 47	67

Brief Summary of Some of the Interesting Displays at the Exposition	Feb. 47	72
Health and Welfare Insurance	Feb. 47	96
Fractional HP Motor Production Increases	Feb. 47	96
NHA Emphasizes Rental Housing	Feb. 47	96
Commercial Air Conditioning	Feb. 47	96
National Association's Wage Agreement Program (E)	Mar. 47	73
Steel Production	Mar. 47	74
Construction Progress	Mar. 47	74
Price Reductions Affect Wage Demands	Mar. 47	74
The Latimer Report	Mar. 47	75
Sell Health—Not Heat! (NWAH&ACA 7 Steps)	Mar. 47	75
Supply Lines Filling Up	Apr. 47	63
Steel Setaside	Apr. 47	63
Motor Shipments	Apr. 47	63
Consumer Spending Shrinking	Apr. 47	63
1947 Building Prospects	Apr. 47	63
Remaining Priorities	Apr. 47	64
Heating Gas Ban	Apr. 47	64
Decreasing Construction Costs	Apr. 47	64
Escalator Pricing	Apr. 47	64
Gas Burner Production	Apr. 47	64
Ban on Closed Shop	Apr. 47	64
Weekly Guaranteed Wage	Apr. 47	64
Labor Peace Seems Likely	Apr. 47	134
Closed Shop Legislation	Apr. 47	134
Our National Resources	Apr. 47	136
Container Outlook	Apr. 47	136
AFL Cautions Member Unions	Apr. 47	138
Welfare Programs	Apr. 47	138
Getting Ready for the Adjustment Period (E)	May 47	57
Cut Your Price—Not Your Throat! Arthur Roberts	May 47	62
Building Controls	May 47	64
American Economy in 1950	May 47	64
Management May Now Speak	May 47	148
Are Prices Too High?	May 47	148
Surplus Property Disposal	May 47	148
Potpourri (E)	June 47	51
Forty-hour Week in Chicago	June 47	55
Copper Outlook	June 47	55
The Wolcott Bill	June 47	55
Eighty Thousand Learners	June 47	55
Factory Built Homes	June 47	55
Tools and Machinery	June 47	56
Asphalt and Tar Roofing	June 47	56
Peak in Construction Cost	June 47	56
Steel Production	June 47	56
Community Property Taxation	June 47	56
Commercial Air Conditioning	June 47	56
Housing Construction Propaganda	June 47	95
Quality of Installation Keynotes Contractors' Success—Arno H. Gerdson, Cincinnati	June 47	68
Truman Doctrine	June 47	122
Unemployment Picture	June 47	122
New Labor Bill	June 47	124
Lumber Prices Decrease	June 47	124
House Cost vs. Wages	June 47	84
Continue Repair Loans	July 47	62
Removal of Limitations	July 47	63
Post-War Problems	July 47	63
Increased Building Costs	July 47	63
Older Workmen	July 47	63
Construction Boom Slows Down, by Thos. S. Holden	July 47	64
A New Secretary—A New Editor (E) ..	Aug. 47	59
More Mechanics Needed	Aug. 47	63
Our Exports	Aug. 47	65
Controls on Building—Non-existent ..	Aug. 47	66
Our National Wealth	Aug. 47	144
Inflationary Drifts	Aug. 47	146
Housing Construction	Aug. 47	146
Depression DeLuxe	Aug. 47	148
Head Over Heals in Automatic Heat (E) ..	Sept. 47	59

Are Profit Sharing Plans a Substitute for Pensions, by Geo. B. Buck	Sept. 47	64	Insulation		
Slab Floor Research	Sept. 47	67	Fuel Savings from Insulation and Weatherproofing	Feb. 46	81
Construction Materials Improve	Sept. 47	67	Reductions in Fuel Bill with Storm Sash and Insulation (Small Homes Council)	Sept. 46	64
Retail Heating-Plumbing Sales	Sept. 47	67	It's the "Fill" That's Important, by John E. Peterson	Nov. 46	76
Heavy Industries Busy	Sept. 47	67	FHA Reports on House Insulation and Basementless Houses	Feb. 47	83
Disabled Veteran's Allowances Increased	Sept. 47	68	Insulation for Air Conditioning Ducts ..	Dec. 47	79
Half-Year Construction Figures	Sept. 47	68	Insulation Requirements	Dec. 47	85
Fire Prevention Week—October 5-11 ..	Sept. 47	68	Jet Furnace		
Have You a Picture—Picture-of-the-Month	Sept. 47	86	"Jet" Furnace (Aircraft Heater)	Jan. 47	134
Beating Material Shortages	Sept. 47	91	Labor		
The Problem of Fuel Supply (E)	Oct. 47	58	We Claim This Work	Jan. 46	104
Warm Air Exports Decontrolled	Oct. 47	67	Needed Immediately—5,000 Apprentices	Jan. 46	106
Installment Curbs Off November 1	Oct. 47	67	Chicago Plan for G.I. Apprentices, by J. D. Ryan	Jan. 46	108
State of the Nation	Oct. 47	67	Answers to Wage Increase Question ...	Feb. 46	58
New Housing Agency	Oct. 47	67	The Seattle Wage Agreement	May 46	54
Catholic Construction Program	Oct. 47	67	Disabled Veterans	Dec. 46	166
Decontrol of Oil Burner Exports	Oct. 47	68	Industry Must Maintain Our Jurisdiction, by Louis L. Narowetz	Jan. 47	120
8th International Exposition	Oct. 47	68	Foreman Union Ruling (Nat'l Foremans' Ass'n)	Jan. 47	162
Electric Radiant Heating	Oct. 47	68	Portal-to-Portal Pay	Jan. 47	162
Dealers Organize 24-Hour Service	Oct. 47	68	Bonus Plan of National Cornice Works ..	Jan. 47	177
Fate of the Wholesaler	Oct. 47	68	Summary of Pending Labor Legislation ..	Mar. 47	82
August Construction	Oct. 47	78	Forty-Hour Week in Chicago	June 47	55
Are Restrictions Returning (E)	Nov. 47	69	The Unemployment Picture	June 47	122
Housing Research at University of Illinois ..	Nov. 47	72	New Labor Bill	June 47	124
Housing Needs	Nov. 47	98	How Taft-Hartley Bill Affects You (E) ..	July 47	57
Jurisdiction—Engineering—Trade Relations, by Louis L. Narowetz	Nov. 47	110	Older Workmen	July 47	63
1927-FWA ... 1947-CAC	Dec. 47	67	Roofing Drivers' Raise	Aug. 47	142
Glass			Labor Supply	Aug. 47	142
Glass—Last Word in Roofing Material ..	Dec. 46	120	"Belo" Work Week Pay Method	Aug. 47	142
Gutters and Downspouts			Liquid Petroleum Gas		
Fundamentals of Roof Drainage	Oct. 46	79	Gas Heating (Liquid Petroleum)	Jan. 47	133
Hammers—Electric or Pneumatic			Growth of LPG Industry, by Howard D. White	Dec. 47	109
Air Hammers Speed Up Seam Closing, by R. C. Nason	Sept. 46	80	Material Collection		
Heating—Houses			Laundry Takes to the Air! by R. C. Nason ..	Mar. 47	99
Radiant Heating System in Which the "Panel" Is Heated by a Warm Air Blanket, by F. E. Giesecke	Jan. 46	123	Modern Industry Depends on Exhaust Systems, by Wm. P. Brotherton	June 47	75
Space Heaters Inefficient	Mar. 46	55	Mathematics		
Supply Risers in Outside Chimney	Apr. 46	67	Shop Problems in Mathematics (Part I) ..	July 47	60
Heating with Infra Red	May 46	61	Shop Problems in Mathematics (Part II) ..	Aug. 47	62
Our New Research Residence	July 46	59	Metal Properties		
Preview of Some Interesting Heating Possibilities—The Heat Pump (Terra-Temp)	Jan. 47	128	The ABCs of Metal Properties (Linde) ..	Jan. 47	167
Solar Energy Utilization	Jan. 47	130	Motors		
Electric Heating	Jan. 47	132	Electric Motor Standards	Jan. 47	140
Gas Heating	Jan. 47	133	Fractional HP Motor Output	Oct. 47	67
"Jet" Furnace (Aircraft Heater)	Jan. 47	134	Oil Heating		
Gas Heats Dallas' Wynnewood Homes ..	July 47	73	Essentials of Oil Burner Service, by E. E. Fuller (Part 6)	Mar. 46	77
Electronic Devices Produce Pure Air ..	Sept. 47	71	Catalytic Heating Oils	May 46	61
Gravity System with Air Filters	Oct. 47	82	Oil Heat Institute's Exposition and Convention	May 46	90
Heat—Pump			Essentials of Oil Burner Service, VII, by E. F. Fuller	June 46	56
The Heat Pump (Terra-Temp)	Jan. 47	128	Oil Heat Increase	July 46	62
Case History of a Heat Pump, by A. C. Crandall	Sept. 47	80	Correct Practice in Oil Heating, by J. J. Mirabile (Part I)	July 46	66
Humidity			Oil Burner Course Available Again, by R. C. Nason	Aug. 46	66
Basement Moisture Problem	Nov. 47	94	Catalytic Fuel Oils, by Wm. A. Sullivan ..	Aug. 46	68
Idea Exchange			Oil for Vaporizing Burners	Sept. 46	55
Chicken Wire Plating Rack	Mar. 46	92	Oil Burner Fires Increasing	Sept. 46	56
Inside Expander	Mar. 46	92			
"Put a Crimp in It"	Aug. 46	81			
Convert Your Soldering Iron	Aug. 46	81			
Infiltration					
We Believe Our "Percentage of Measurable Loss" Is the Safest Method of Figuring Infiltration, by E. K. Campbell ..	Mar. 47	94			

Correct Practice in Oil Heating (Part 2), by J. J. Mirabile	Sept. 46	59
Oil Burner Fires Increasing	Sept. 46	56
Status of Oil Burners	Oct. 46	57
Oil Burner Transformers	Nov. 46	64
Correct Practice in Oil Heating (Part 3), by J. J. Mirabile	Nov. 46	73
Catalytic Fuel Oil Supply (Sun Oil Com- pany)	Nov. 46	80
Save Fuel by Survey! by E. F. Fuller ..	Sept. 46	66
New Distillate Fuel Supply	Jan. 47	162
Correct Practice in Oil Heating (Part IV), by J. J. Mirabile	Feb. 47	80
Part V	Mar. 47	85
Part VI	Apr. 47	70
Oil-Burner Production	May 47	64
Fill Oil Tanks Now	July 47	62
Correct Practice in Oil Heating (Part VII), by J. J. Mirabile	July 47	74
Fuel Oil Report	Aug. 47	66
AA Reports on Oil Supply	Aug. 47	76
Correct Practice in Oil Heating (Part VIII), by J. J. Mirabile	Sept. 47	75
Oil—Scarce in the Land of Plenty? ...	Oct. 47	63
Decontrol of Oil Burner Exports	Oct. 47	68
Correct Practice in Oil Heating (Part IX), by J. J. Mirabile	Oct. 47	71
July Oil Burner Shipments	Nov. 47	72
Correct Practice in Oil Heating (Part X), by J. J. Mirabile	Dec. 47	81

Panel Heating

Radiant Heating System with Warm Air Blanket, by F. E. Giesecke	Jan. 46	123
Heat Losses from Floors Laid on the Ground, by Richard S. Dill; Wm. C. Robinson; H. C. Robinson	Jan. 46	132
Panel Heating Under Wood Floors	May 46	61
Panel Heating—A Basic Discussion, by S. Konzo	Oct. 46	68
In Any Floor Panel System It's the "Fill" That's Important, by John E. Peterson	Nov. 46	76
Solar House—Heated by a Warm Air Floor Panel, by John E. Peterson	Dec. 46	83
Design Data for a Warm Air Floor Panel, by Axel B. Algren	Jan. 47	141
A Warm Air Ceiling Panel System	Feb. 47	75
New Passenger Planes Heated by Con- vection-Panel System	Feb. 47	82
Panel Heating of Concrete and Wood Floors with Conditioned Air	Mar. 47	89
Let's Take the Hooey Out of Panel Heating! (E)	Apr. 47	57
Warm Air Floor Panel, Opened to Pro- vide Partial Convection Heating, Heats to -8 Deg. F., by John E. Peterson ..	Apr. 47	74
Time Lag in Floor Panel Systems De- pends on the Floor Mass Under the Air Space, by Warren E. Wilson	May 47	69
Steel Floor Warm Air Panel, by John E. Peterson	June 47	61
Wood "Panels" Not Permitted	July 47	62
Warm Air Ceiling Panel (Closed System)	July 47	77

Patterns

Round Elbows of Welded Construction, by J. P. Harner (Part I)	Jan. 46	170
(Part II)	Feb. 46	96
(Part III)	Apr. 46	80

Pattern Development, by Wm. Neubecker

Heavy Gauge Blow Pipe Fittings (Dust Conveying Floor Sweep)	Apr. 46	84
Heavy Gauge Blow Pipe Fittings (Ad- justable Forge Vent Hoods)	June 46	72
Air Conditioning Fittings—Diffuser El- bow	Sept. 46	63
Pattern for a Three-Piece Offset	Oct. 46	72

Pattern Layout—Oval to Round	Mar. 47	92
Dust Collector Hopper Spirals	Apr. 47	82
Heavy Gauge Blowpipe Fittings	July 47	86
Dust Collector Trap	Sept. 47	91
Duct Intersection—Square to Round ...	Oct. 47	80
Transitional Compound Offset	Nov. 47	105
Triple Branches Connecting to Square Duct	Dec. 47	86

Problem Corner

How to Size a Gas Burner	Feb. 47	86
Soldering Chromium Plated Metal	Feb. 47	86
Return Grille Location	Feb. 47	86
Cleaning Fire Tarnished Stainless	Apr. 47	79
Warping in Welding Stainless	Apr. 47	79

Roof Drainage

Fundamentals of Roof Drainage	Oct. 46	79
-------------------------------------	---------	----

Roofing

Glass—Last Word in Roofing Material ..	Dec. 46	120
Asphalt Roofing and Siding—Jan. Pro- duction	May 47	64
Asphalt and Tar Roofing—March Ship- ments	June 47	56

Schools

Pictorial Instruction for Sheet Metal Training, by Wm. Neubecker	Jan. 46	157
Syracuse Short Course	Feb. 46	104
Dealer Training Schools Have Started ..	Apr. 46	58
Southern California Sponsors Schools ..	Apr. 46	96
Application Engineering Conferences (NWAH&ACA)	June 46	94
Oil Burner Course Available Again, by R. C. Nason	Aug. 46	66
Coal Bin—Ash Bucket to College (U of I)	Aug. 46	100
Purdue "Practical" Engineering Course, by H. C. Gillespie	Feb. 47	64
Boston Technical Institute	Mar. 47	138
Warm Air "Short Course"	May 47	94
Indoor Comfort Conferences Expand ..	Dec. 47	70

Service—Oil Burner

Essentials of Oil Burner Service (Part 6)	Mar. 46	76
(Part 7)	June 46	56

Sheet Metal—Architectural

Pictorial Instruction Course for Sheet Metal Training, by Wm. Neubecker ..	Jan. 46	156
Chimney Cap for Arched and Corrugated Roof	Feb. 46	92
Marquise—A Non-Competitive Profit Maker, by Lawrence E. Gichner	Apr. 46	77

Sheet Metal—Finishing

Electrostatic Principle of Spray Painting, by S. T. Dingman	Jan. 46	153
Electrostatic "Detearing" in Dip Paint- ing, by S. T. Dingman	Feb. 46	89
Cleaning Metal for Finishing, by Stanley Dingman	Jan. 47	159
Ventilation for Spray Painting, by Allen D. Brandt	May 47	79
Color Mixing and Matching, by Stanley T. Dingman	Aug. 47	93

Shop Layout

Suggested Arrangement for a Heating Dealer's Office and Shop, by E. E. Zideck	Feb. 46	59
Correct Practice in Oil Heating (Part 1), Arranging the Shop, by J. J. Mirabile	July 46	66
Machinery Worth Quarter-Million Builds Buse's Ship Outfitting Reputation, by R. C. Nason	Jan. 47	153
Unusual Sheet Metal Work, by Walter Rudolph	Dec. 47	95

Solar Heating			
Solar Energy Utilization	Jan. 47	130	
Soldering			
Convert Your Soldering Iron	Aug. 46	81	
Soft-Soldering Non-Ferrous Metals	Mar. 47	104	
Soldering Aluminum & Stainless Steel .	July 47	93	
Stainless			
Short on Profit?—Try Stainless! by L. E. Gichner	Aug. 46	82	
Stainless Steel Sinks—Custom Made ...	Dec. 46	114	
Standards			
NYMSMC Standards for Manufactured Gas	Jan. 47	136	
Steel			
Confusion Rules the Steel Picture, by Arnold Kruckman	Nov. 46	62	
Steel Production	June 47	56	
Steel Scarcity	Aug. 47	66	
Fourth Quarter Steel Export Quotas ...	Nov. 47	72	
Stokers			
Rules for Determining Stoker Size, Com- bustion Volume and Clear Height, by Raymond R. Tucker	June 46	64	
Stoker Status	Aug. 46	60	
What's Ahead in Postwar Stokers?	Oct. 46	67	
New "Stoker-Pilot" Sees the Flame	Nov. 46	82	
Taxes			
1946 Tax Economies, by Arthur Roberts	Jan. 46	117	
The Family Partnership	Jan. 46	119	
Partnership or Corporation (Part 5) ...	Mar. 46	60	
How to Reduce Payroll Taxes Under Merit Rating (Part 1)—Research In- stitute of America	Dec. 46	78	
(Part 2)	Jan. 47	107	
(Part 3)	Feb. 47	68	
(Part 4)	Mar. 47	78	
(Part 5)	Apr. 47	60	
(Part 6)	May 47	60	
(Part 7)	June 47	57	
Community Property Taxation	June 47	56	
More State Income Taxes	July 47	85	
Family Partnership Taxes	Aug. 47	144	
Partnership and Your Income Tax	Dec. 47	71	
Tin			
Tin Is Still Hard to Get	Feb. 47	67	
Tin Still Controlled	Apr. 47	134	
Tools			
Pneumatic Tools—for the Sheet Metal Shop, by E. E. Zideck	June 47	79	
(Blank Preparation)	July 47	89	
Blank Preparation (2)	Sept. 47	97	
Save Time and Money with Compressed Air	Oct. 47	85	
Blank Preparation (3)	Oct. 47	90	
Tools and Their Uses, Press Blanking..	Nov. 47	99	
Tools and Their Uses—Sheet Metal Forming, by E. E. Zideck	Dec. 47	103	
Ventilation			
New 125-ton Ventilation Job	Nov. 46	92	
Sheet Metal Shop—Bronx Office—Wall Street, by R. C. Nason	Dec. 46	117	
Air Conditioning and Ventilation Sys- tems to Safeguard Health and Comfort of Workers, by E. E. Herbacek	Mar. 46	67	
Ventilation for Spray Painting, by Allen D. Brandt	May 47	79	
International Labor Organization Ven- tilation Code	May 47	98	
Ventilating a Melting Pot	July 47	88	
Wage Incentives			
Are Profit Sharing Plans a Substitute for Pensions, by Geo. B. Buck	Sept. 47	64	
Basis for Wage Incentives	Oct. 47	66	
Types of Wage Incentive Payments	Nov. 47	74	
Wage Incentive Plans	Dec. 47	72	
Washington Letter, by Arnold Kruckman			
Dept. of Commerce—Washington's New- est Ogre	Jan. 46	114	
The Status of Heating Equipment	Feb. 46	54	
Heating Equipment Situation Is Con- fused	Mar. 46	56	
Washington Is Drowning in VHP—No. 1	Apr. 46	48	
Price Increase Plus Non-Existent Mate- rials	May 46	52	
Housing Goals Have Not Been Reached	June 46	42	
Watch for Drastic Changes in Housing Program	July 46	52	
Warm Air Furnace Ratings Established .	Aug. 46	54	
Washington Viewed from the Outside ..	Sept. 46	50	
Is It Price or Profit Control?	Oct. 46	58	
Confusion Rules the Steel Picture	Nov. 46	62	
Housing Still the Big Issue	Dec. 46	72	
Agenda for 1947	Jan. 47	110	
The Congressional Program	Feb. 47	62	
Labor Legislation Under Discussion	Mar. 47	76	
Can We "Contain" Russia?	Apr. 47	58	
"Bureaus" on the March Again	May 47	58	
Plenty of Steel—at \$240 a Ton!	June 47	52	
The Overall Picture—Europe and Here .	July 47	58	
Our Future Steel Needs	Aug. 47	60	
Administration Swings the "Big Stock"	Sept. 47	60	
Cost of "Marshall Plan"	Oct. 47	60	
"State of the Union"	Nov. 47	70	
Reaction to Truman's Message	Dec. 47	68	
Waste Removal			
Design of Waste Removal Systems (Part 1), by H. M. Nichols	Sept. 47	94	
(Part 2)	Oct. 47	88	
(Part 3)	Nov. 47	103	
(Part 4)	Dec. 47	99	
Welding			
Round Elbows of Welded Construction, by J. P. Harner (Part 1)	Jan. 46	170	
(Part 2)	Feb. 46	96	
(Part 3)	Apr. 46	80	
Fabrication of Stainless Steel, by Wm. P. Brotherton (Part 1)	Feb. 46	85	
(Part 2)	Mar. 46	81	
Melting Points of Metals and Alloys	Oct. 46	84	
Resistance Welding, by F. R. Woodward	Oct. 46	86	
Jigs and Fixtures for Sheet Metal Weld- ing, by A. N. Kugler (Part 1)	Sept. 46	73	
(Part 2)	Nov. 46	85	
(Part 3)	Dec. 46	111	
Welding Output Doubled by Atomic Hydrogen Process, by Wm. P. Brother- ton	Jan. 47	163	
Machine Bases of Welded Plate	Feb. 47	94	
Jigging for Better Welds (Part 1)	July 47	83	
(Part 2)	Aug. 47	89	
Finish Treatment of Welds	Sept. 47	89	
Automatic Welding Process	Sept. 47	96	
Welding Aluminum in Heavy Gauges ..	Oct. 47	94	
Seam Welding Aid	Nov. 47	106	
Welding Aluminum in Heavy Gauges ..	Dec. 47	102	
Zinc			
To Aid Zinc Output	Sept. 46	128	
Surplus Zinc	Nov. 46	79	

Sets the gait for '48 . . .

Engineered to meet all modern needs and proof-tested for performance, REX Blowers set the pace for leadership by better design, smooth operation and trouble-free service. You can give your equipment an added sales feature by using REX Blowers—it's a feature you cannot afford to overlook.



Only REX Blowers Can Offer You All These Outstanding Features...

Accessible, long-lasting oiling element . . .

The new streamlined bearing bracket with the sight-feed oil gauge, and oil reservoir cap near the top of the Blower, permits ease of lubrication. This revolutionary bearing holds 2 to 4 times as much oil as conventional bearings.

Adjustable cutoff . . .

Equally efficient against high or low resistances by simple adjustment.

Interchangeability . . .

The REX "SQAIR" Blower can be used for either standard or "High-Boy" furnaces.

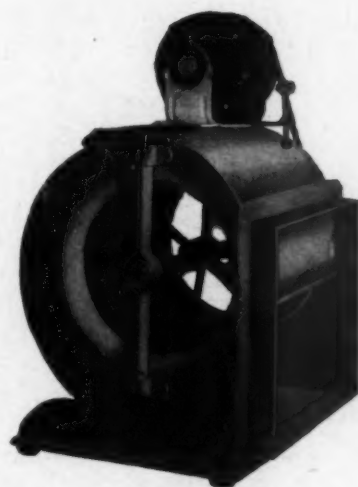
Rigidity . . .

The extra heavy construction of the new REX Blower line insures sturdiness. Cross-bracing maintains alignment and quiet operation.

Reliable . . .

The operating record of thousands of REX Blowers which are in actual operation on air conditioning equipment is the best testimonial to their reliability.

When considering your next blower application, avail yourself of REX SERVICE. Our engineers will be glad to work with you and help you select the correct blower for your job. Write for Catalog 247.



2310 SUPERIOR AVE.

CLEVELAND 14, OHIO

NEW LITERATURE

Use the Coupon on Page 134

261—Solenoid Contactor

Bulletin 4451—a. c. contactors—describes and illustrates the new size 1 a. c. Solenoid Contactor—the first of a new line of control equipment.—*Ward Leonard Electric Co., 31 South St., Mount Vernon, N. Y.*

262—Measuring Air Velocity

A 4-page folder illustrates and describes a complete portable air-meter, including power pack. Pictures show the meter being used with graduated wand to measure air flow from an air-conditioning grille, checking cooling of an electric motor, and to measure circulation of air over a radiator.—*Hastings Instrument Co., Inc., Hampton, Va.*

263—The Selling Man

The techniques involved in specialty selling has just been published. "The Selling Man" by W. A. Matheson, executive vice-president, Eureka Williams Corporation, Bloomington, Illinois, in charge of the Williams Oil-O-Matic Division, deals with fundamentals basic to all selling.

Men who make selling their profession will find in it the added elements of drama and adventure as they follow Frank Crawford, oil burner salesman and "hero" through the various steps involved in making a sale.

Every step involved in the making of a sale is detailed.

"The Selling Man" is 259 pages, 6 x 9 inches, bound in blue cloth. Price \$5.00—*Heating Publishers, Inc., 232 Madison Ave., New York 6.*

264—Date First Freezing Weather

A new slant on direct mail advertising to stimulate heating and appliance business is being offered.

Based on a two-year study by the Department of Commerce Weather Bureau of the recorded average daily minimum temperatures of various climatological sections of the United States covering a period of 20 years, this exclusive three-fold mailing folder carries a teaser on the cover which assures its prompt opening by every home owner it reaches. This is the copy which does the trick—"Look inside for the date freezing weather will strike this year."

Opening the folder the reader finds a colorful authentic weather map upon which is shown the week the first siege of freezing weather will strike in each community of the United States.

This mailing piece opens into a full-page spread upon which is illustrated the various heating appliances manufactured by Rheem.

The first freezing weather in the United States normally occurs in the western part of Wyoming, September 14. The first freezing weather in that section actually took place this year on Monday, September 15.

This direct mail advertising is a copyrighted Gil Thompson creation designed for Rheem and produced by Davis-Delaney of New York.—*Rheem Manufacturing Company, 570 Lexington Ave., New York 22, N. Y.*

~~~~~

FOR VITALIZED HEAT

USE

**Convector**

HUMIDIFIERS

- ★ When you sell humidity, sell Maid-O'-Mist which gives your customers MORE humidity per \$ cost!
- ★ One of the finest AUTOMATIC humidifiers available is this Maid-O'-Mist Convector . . . product of advanced engineering and precision manufacture—modern as tomorrow's newspaper.
- ★ From the standpoints of price, satisfactory performance, ease of installation, and long service, it's miles ahead.
- ★ Learn the facts, and you'll be fully as enthusiastic as we are about the tremendous profit possibilities of this unique and entirely different product.

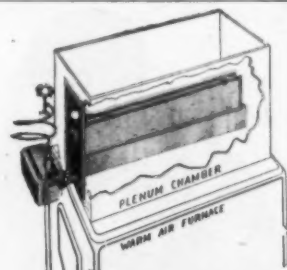
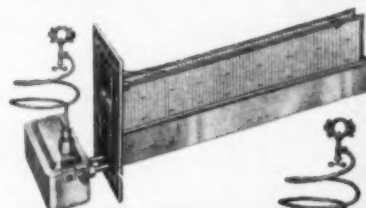
**MAID-O'-MIST INC.**

3213 N. PULASKI RD.  
CHICAGO 41, ILLINOIS



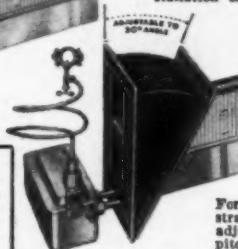
**AUTOMATIC HUMIDIFIERS**  
FOR ALL TYPES OF HEATING SYSTEMS

**AUTOMATIC  
FAST-ACTING  
HIGHLY EFFICIENT  
EASY TO INSTALL.  
EASY TO SERVICE!**



Showing proper installation of a 2-Trough "CONVECTOR" Humidifier on an Air Conditioning unit . . . straight-side mounting.

For straight-side plenum chamber installation only.



For both sloping and straight plenums — adjustable 0° to 90° pitch.

### FEATURES

- 1 Evaporates MORE water with minimum of air flow restriction.
- 2 Water reservoir located away from heat of the furnace.
- 3 Non back-siphoning water feed valve fully approved by National Plumbing Laboratory.
- 4 Furnished complete with 6' of copper tubing, saddle valve, fittings, and installation instructions.

**Come to HUMIDITY HEADQUARTERS**

Maid-O'-Mist manufactures a complete line of humidifiers, humidifier valves and accessories. It pays to handle all of this high-grade, yet low-priced equipment. Write us, or see your jobber!

# JUST PUBLISHED

## New handbook on Air Diffusion

**How to select, install and adjust diffusers  
for greater control of air conditioning performance**

The new handbook contains the latest engineering data on air diffusion in general and the use of adjustable air diffusers as a positive means of eliminating drafts, hot spots, cold spots, poor humidity control, stratification, air noise, ceiling smudge and other complaints. It is profusely illustrated with photographs, sketches, charts and dimension prints for quick, accurate Selection—Application—Location—Assembly—Erection—Testing—Adjustment of Air Diffusers and of Accessory Equipment such as air equalizing grids, mounting rings and air sectorizing baffles.



*Illustration from handbook showing how  
Kno-Draft Adjustable Diffusers blend with interior.*

**BEAUTY** for an air diffuser lies in its simplicity and ability to blend with an interior. Kno-Draft Diffusers in their original aluminum furnish an interesting and unobtrusive decorative accent. Painted to match the ceiling, they become self-effacing. Because of this simplicity of design, Kno-Draft Diffusers blend easily with modern or period interiors.

### W. B. CONNOR ENGINEERING CORP.

*Air Diffusion • Air Purification • Air Recovery*

112 East 32nd Street



New York 16, New York

IN CANADA: Douglas Engineering Co., Ltd., 1405 Bishop St., Montreal 25, P. Q.

**FREE**  
to those who  
design, install  
and maintain  
air conditioning  
equipment



*Illustration from handbook showing  
industrial application of Kno-Draft Diffusers.*

**UTILITY:** The air direction and volume on each Kno-Draft Diffuser can be altered *after* installation. This eliminates the tough job of deciding everything about the air movement in advance. Also, you can change the air pattern with the seasons or when processes, people or partitions are relocated.



**ECONOMY:** Kno-Draft Adjustable Diffusers save time and money three ways. **1. Installation**—Special self-contained inner unit construction saves installation time—some contractors report up to fifty per cent. **2. Balancing**—Capacities of diffusers may be read directly and simply on a velometer and the air volume change can be made by simply turning a screw. **3. Adjustment**—No "after-installation" worry. Complaints are adjusted simply and quickly.

W. B. Connor Engineering Corp.  
Dept. J-17, 112 East 32nd Street  
New York 16, New York

Please send me a copy of the new Kno-Draft Handbook on Adjustable Air Diffusers.

NAME \_\_\_\_\_

POSITION \_\_\_\_\_

COMPANY \_\_\_\_\_

STREET \_\_\_\_\_

CITY \_\_\_\_\_ ZONE \_\_\_\_\_ STATE \_\_\_\_\_

**Be A  
Blower Dealer**



Convert any gravity furnace into a modern forced-air heating plant with the Viking Blower Package. Engineered for quick, easy installation... quick, certain profits for you.

## ANOTHER **Viking** PROFIT BUILDER

SERIES 1100 HUMIDIFIER  
FOR FORCED AIR  
HEATING SYSTEMS



A companion package that makes your conversion job a complete WINTER AIR CONDITIONING SYSTEM. Designed to fit all types of furnaces. Complete data in Bulletin 349.



## **Viking** No. 11 KIT

AUTOMATIC WATER  
PAN FILLER FOR USE  
ON ANY FURNACE

A complete package. Carry one at all times. Quickly, easily installed. Helps make an inspection trip a profitable call.

# Viking

AIR CONDITIONING CORP. 5600 WALWORTH AVE.  
CLEVELAND 2, OHIO

## NEW LITERATURE

Use the Coupon on Page 134

### 265—Geometric Furnace Construction

A four-page folder gives prerequisites of a modern domestic air conditioning unit, and comparative data of the conventional and the Geometric construction. Series-C (domestic) and Series-D (industrial) are illustrated.—*Miles Heating Enterprises, Cleveland 15.*

### 266—Alodine and Alodizing Process

A four-page folder describes Alodine to protect aluminum and alloys from moist or salt-laden atmospheres, and to anchor the finish.

A flow sheet gives the usual production sequence for Alodizing. Important and characteristic features of this process and data on the coating produced are tabulated in chart form.—*American Chemical Paint Co., Ambler, Pa.*

### 267—Vitron Glass Fibers and Fabrics

An 8-page booklet tells of a new plant and modern equipment for the manufacture of fibrous glass. There are facts about the product, the process and the company. Vitron glass fibers are flexible, have dimensional and physical stability, tensile strength, are incombustible, and are plied into continuous filament yarns of standard types and sizes to meet the needs for glass yarns, glass tapes, glass cloth, coated glass fabrics.—*Glass Fibers, Inc., Waterville, Ohio.*

### 268—Kno-Draft Handbook

A new catalog and engineering data book on Kno-Draft adjustable ceiling air diffusers contains all the information and data necessary for the proper selection of air diffusers. Besides full catalog data on the several Kno-Draft diffuser types and accessories, much information of a general nature on the subject of air diffusion is included.

With Kno-Draft diffusers the air supply can be directed at any angle from vertical to horizontal and its volume regulated in each diffuser. The air volume control, a cylindrical, sleeve-type damper within the neck of the diffuser, permits rapid balancing of the system as well as increasing or decreasing at will the air supply at individual points or zones.

Ability to control both air direction and volume, after installation, removes the hazard of unpredictable or unforeseen conditions and alterations in interfering with the desired air diffusion plan and relieves the design engineer of the obvious burdens imposed by fixed types of air terminals. Both adjustments are made externally and are independent of each other. At constant static pressure, neither affects outlet velocity nor diffusion pattern.

Installation economy is another feature of these diffusers. The inner assembly of the diffuser (lower cone and damper) is removed and replaced as a unit. This is especially advantageous where ceilings already exist as by simply removing the inner assembly the outer cone is attached to duct or collar quickly and easily.—*W. B. Connor Engineering Corp., 114 East 32 St., New York 16, N. Y.*



## NEW LITERATURE

Use the Coupon on Page 134

### 269—Aluminum Roofing

Kaiser Aluminum Roofing for homes, farms, warehouses, industrial and utility buildings—corrugated 1¼, 2½, 3 in., 5-V crimp—is described in a 4-page folder. Width is 26, thickness .019 in general use but .024 and .027 in. are also available. Lengths are 72, 96, 120 and 144 in.—*Permanente Products Company, 1924 Broadway, Oakland 12, Calif.*

### 270—Heating Guides for Architects and Engineers

A series of Heating Guides for architects, builders and heating engineers aims to provide technical information relative to best applications for various types of heating systems, most suitable arrangements of ducting, furnace locations, etc.

Floor plan examples, building sections showing suitable ducting, locations of registers or convectors, suggested specifications covering installations, and other details for gravity and forced-air circulation systems, radiant floor and wall panel systems for either warm air or hot water systems, recommended conversion burner installations, systems for both single and multiple dwellings with and without basements, commercial and industrial systems are all treated in the series of guides. Color has been used to clarify the various drawings and plans. Ten guides in all will be published. Three are now available. Each guide is tabbed for ready filing.

In the compilation and arrangement of the data given in the guides, the collaboration and assistance of Professor S. Konzo, School of Heating and Ventilating Engineering, University of Illinois, has been obtained to assure the presentation of authoritative and accurate information of direct value in determining and specifying the proper sizes and types of systems for various applications.

The three guides now ready are entitled "Winter Air Conditioning," A.I.A. No. 30B, "Gravity Warm Air Heating Systems," also No. 30-B, and "Conversion Burners for Remodeling," A.I.A. No. 30-C-4. The "Winter Air Conditioning" guide covers forced-air systems with or without humidity control, and the Gravity guide all types of gravity systems utilizing either natural, manufactured, mixed or liquefied petroleum gas. These two guides thus form a pair covering convected air systems. Single copies of the guides are available on request. A nominal charge will be made in quantity lots.

Titles of the remaining seven guides are "Fuels and Fuel Conservation," "Heating Systems in Review," "Hot Water and Steam Systems," "Multiple Dwellings—Basementless Houses," "Radiant Panel Gas Heating," "Commercial and Industrial Systems," and "Janitrol Equipment—Gas Heating."—*Janitrol Division, Surface Combustion Corporation, Toledo 1, Ohio.*

MANUFACTURERS!

## Viking EFFICIENCY

Puts Quality  
in Your Furnace

Viking Blower assemblies are recognized by the entire industry as the most efficient, trouble-free unit ever developed. And, the complete unit costs less than one you, as a furnace manufacturer could build or assemble yourself.

Viking Dependable Humidifiers  
Add Winter Air Conditioning  
to Your Furnace

SERIES 1300  
FOR POPULAR  
SIZED FURNACES

A complete float operated humidifier especially designed for small plenum installations. Incorporates the famous Viking Top Seat float valve for longer, trouble-free service under all conditions. Bulletin 349 contains complete data.

Write Today for

Viking  
BLOWER CATALOG

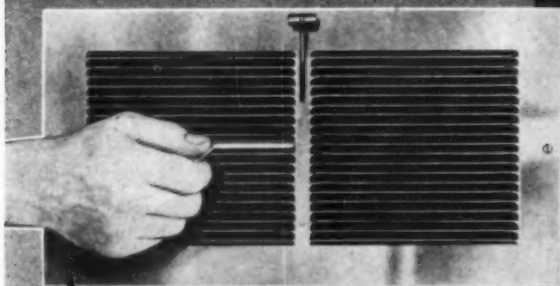
Contains complete specifications on blower units for any size furnace at any capacity.



# Viking

AIR CONDITIONING CORP. 5600 WALWORTH AVE.  
CLEVELAND 2, OHIO

H & C NO. 74 A.C. REGISTER



**W**hen pennies

shout like dollars and it's necessary to get down to rock-bottom cost, the H&C No. 74 design meets the situation as no other air conditioning register does. It's as carefully built and finished as the very finest, affording any upward or downward deflection desired, with a valve that really stays put under all conditions — a register that has quality written all over it, and yet is priced close to the most inexpensive. For meeting competition without sacrificing reputation for quality, the H&C No. 74 is, indeed, the perfect choice. See your H&C Jobber or write for our new No. 48 catalog presenting the ideal register for every type of installation.



**HART & COOLEY  
MANUFACTURING CO.**

World's Largest Manufacturers of  
Registers, Grilles, Furnace Accessories  
**HOLLAND · MICHIGAN**

## NEW LITERATURE

Use the Coupon on this page

### 271—1948 Calendars With Tables

Large calendars for 1948 have important reference tables on the last page, especially compiled for the trade, giving information on United States standard revised comparison of wire gauges; expansion and contraction; diameters, circumferences and areas of circles; contents of round tanks; physical properties of metals; sizes of drills to be used for corresponding U. S. standard taps; slopes of roofs; also weights and measures and useful rules of calculation.—David Levow, 308 West 20th Street, New York 11.

American Artisan,  
6 N. Michigan Ave.,  
Chicago 2, Ill.

Please ask the manufacturer to send me more information about the equipment mentioned under the following reference numbers in "Equipment Developments" and "New Literature." (Circle numbers in which you are interested):

|     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|
| 183 | 184 | 185 | 186 | 187 | 188 | 189 |
| 190 | 191 | 192 | 193 | 194 | 195 | 196 |
| 197 | 198 | 199 | 200 | 201 | 202 | 203 |
| 261 | 262 | 263 | 264 | 265 | 266 | 267 |
| 268 | 269 | 270 | 271 |     |     |     |

Name.....

Company.....

Address.....

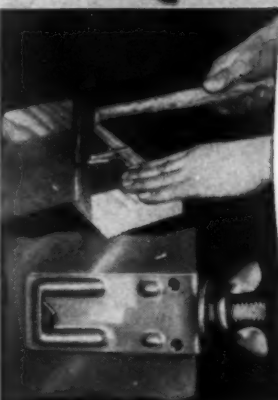
Are you manufacturer? ☐ Jobber? ☐ Dealer? ☐

## H&C KWIK-WAY DAMPER REGULATOR SETS



Most Easily and Quickly  
Attachable Sets on the Market  
**STURDY • RATTLE-PROOF  
NO ANVIL REQUIRED**

**IDENTICAL 5/16"  
RETRACTABLE BEARINGS**



Simply slip the bearing over the edge of the damper at the bearing line. Lay on any firm surface and strike one solid hammer blow. The prong pierces the damper and is clinched securely in place by the heavily ribbed underside construction of bearing. Fastening is permanently solid, rattle-proof. Identical bearings with retractable bolt make easier installation of regular or splitter dampers in round or square ducts.

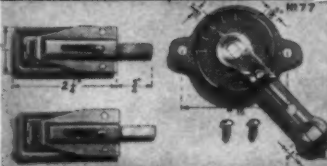
#### LIST PRICES

No. 70 Set.....\$0.30  
No. 77 Set.....0.40

#### FOR LARGE DAMPERS

No. 50 3/4 Set.....\$0.60  
No. 80 3/4 Set.....0.60

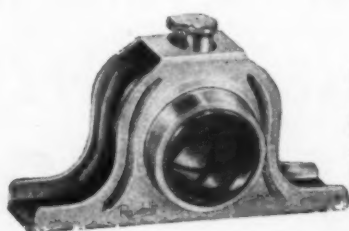
See your jobber or  
write for literature.



**HART & COOLEY MANUFACTURING CO.**  
**HOLLAND MICHIGAN**

# **RANDALL** **double-** **lubricated** **PILLOW BLOCKS**

... help you sell the job



NO. 248

A new, lower priced pillow block, the right, double-lubricated Randall for many air handling uses.

WHEN competition's tough and the prospect hesitates, Randalls can help you close the sale. Standardize on Randall Pillow Blocks and make their exclusive oil-graphite double lubrication part of your selling story.

Tell how the right Randall costs no more, lasts for the life of the equipment . . . that only Randalls have lubricating graphite inserted right into the phosphor bronze sleeve . . . plus the added protection of oil that feeds through the graphite from big single or double oil reservoirs in self-aligning ball housings.

Get the detailed story of double-lubricated Randall protection, and the complete Randall line. Write for Catalog 47. You'll find it has valuable installation hints, too.

## **Randall Graphite Bearings, Inc.**

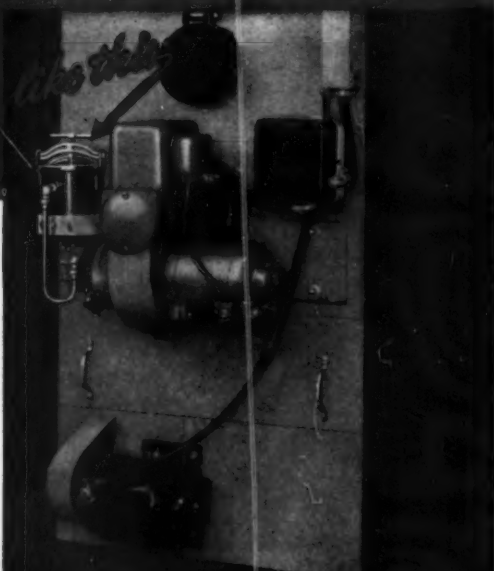
DEPT. 1211, 609 WEST LAKE STREET, CHICAGO 6, ILLINOIS

# *The General*

Make profits on every installation.  
Eliminate troublesome call backs.  
Build regular repeat business through cartridge replacements.  
Help customers save money by giving cleaner burning fuel.  
Build goodwill and customer loyalty by providing trouble-free operation.



## **CAN INCREASE YOUR SERVICE DOLLAR VOLUME WITH INSTALLATIONS**



### **General HAS THE RIGHT FILTER FOR EVERY OIL HEATING PLANT!**

The General is popular with all contractors, dealers and fuel oil service companies because it has proven the best fuel oil filter for heating plants, hot water heaters, and room heaters. The General will prove a profitable leader for you, too! Report after report in our files bear out these statements.

For average installations three models, DeLuxe 2A-300, Master 2A-700 and Economy 1A-25, are outstanding leaders in the General line because they are priced to sell easily, built to give long-lasting service, and designed to provide high-degree performance.

There is no better time than now in letting General Fuel Oil Filters increase your service dollar volume. Contact your jobber immediately or write direct for information and discounts.

Listed: Re-examination Service, Underwriters Laboratories

**GENERAL FILTERS  
INCORPORATED**

CANADIAN FACTORY BRANCH: GENERAL FILTERS CANADA, 173 STRACHAN AVE. • TORONTO 10, ONTARIO

VISIT OUR EXHIBIT, SPACE 549, INTERNATIONAL HEATING AND VENTILATING EXPOSITION, FEBRUARY 2-6.

12890 WESTWOOD AVE.  
DETROIT 23, MICHIGAN



## Make More Ventilator Sales

with the high quality  
business-getting features of  
**Swartwout Ventilators**

All industrial plants in your locality, and many commercial buildings such as warehouses, garages, recreation buildings, etc. are excellent prospects for *improved ventilation* by means of modern Swartwout Roof Ventilators. You can supply every such need with the types listed below. Their scientific design, sturdy construction and convenient installation procedure assure you completely successful results and satisfied customers. *Write for new complete Swartwout Catalog Bulletin 324.*

The Swartwout Co., 18615 Euclid Ave., Cleveland 12, O.

### Swartwout AIRMOVER

Most modern large scale ventilation equipment. Only 32 inches high, features short air travel, large capacity, economical cost.

### Swartwout-Dexter Heat Valve

Continuous opening ventilator providing natural draft plus outside air suction. The original ridge type ventilator.

### JECT-O-VALVE

Efficient "straight-through" type provides powerful exhaust for unusually tough ventilating needs.

### AIRVALVE

A highly efficient round-type ventilator for many uses where economical equipment is desirable.

### AIRJECTOR

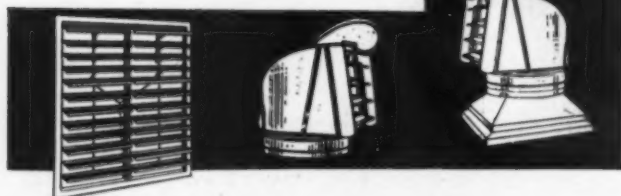
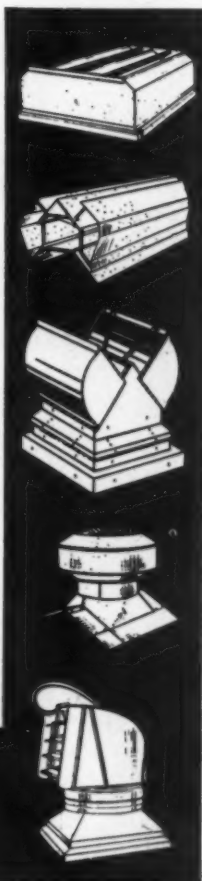
Power ventilator built on the rotary principle. Combines low cost power air movement and gravity flow with wind suction.

### ROTARY

For many years industry's most popular type ventilator. Swings on permanently oiled sealed ball bearings.

### INTAKE LOUVERS

The ideal modern method of providing fresh air in commercial and industrial buildings. To get hot bad air out, let fresh air in.



**Swartwout**  
*Controlled* Air Circulation

EQUIPMENT FOR EFFECTIVE ECONOMICAL  
VENTILATION OF INDUSTRIAL BUILDINGS



## Now Available! THE NEW JOHN ZINK No. 50 "SHORTY" FLOOR FURNACE

50,000 Btu/hr.

A.G.A. Approved

— ONLY 26" DEEP —

This new No. 50 floor furnace is especially designed for installation where under-floor space is limited. Being only 26" deep, it can be installed where foundations are extremely low, eliminating the necessity of making a pit.

Burns Natural, LP and Mixed Gases

Write for Literature

## John Zink Company

4401 South Peoria

TULSA, OKLAHOMA

New York - Salt Lake City - Houston - Los Angeles

## WITH THE CONTRACTORS

Contractors are invited to write and tell us about their new shops, new locations, new store fronts, display windows, changes in management, etc.

Pictures will be appreciated and returned, if requested.

### Piper Builds Curing Oven

**J.** A. PIPER ROOFING Co., Greenville, S. C., has completed a curing oven which is being shipped to Medellin, Colombia, S. A. This oven was built in the Piper shops, although the burners, bearings and roller were fabricated by others. The resin curing oven was



Resin Curing Machine

crated in two sections, each crate measuring about 10 by 10 by 9 feet, and the oven weighed 16,000 pounds after crating.

The Pipers have fabricated driers of this type for shipment to North Carolina, Virginia, Alabama, Tennessee and New Hampshire. They are now working on two ovens which had been placed with fabricators in Chicago, but it took them so long to build the first oven that two others were cancelled by the machinery people, who just loaded 19,000 lbs. of partially fabricated angle iron, channel and sheets on a truck which made a through trip to Carolina for fabrication and shipment to another state.

John Fred Hofman of the John Hofman Co., heating and sheet metal shop located at 77 Galena Street, Dixon, Illinois, is mayor of the city of Dixon.

This shop was operated by John Hofman, the father, for 47 years in Dixon. John Fred purchased the business from his father upon his return from the Army, and later was elected mayor of Dixon.



Those big muddy footprints, left by some well-intentioned oil man, are a sure sign **this oil-heated home needs VENTALARM Signal.**

With VENTALARM Signal installed on a cellar oil storage tank, there is no need for the oil chauffeur to enter the home — or even ring a doorbell. The oil burner installation becomes **completely automatic** even to fuel delivery!

VENTALARM'S clear whistle (audible through the vent pipe out-of-doors) ceases instantly when the tank is properly filled. No spillage — no overflow — property is protected!

When you install a burner or when your service man makes a service call, there's **EXTRA PROFIT** in selling the housewife VENTALARM Convenience!



AVAILABLE AT YOUR FAVORITE SUPPLY HOUSE.  
Write us for special customer mailing folders.



# Nu-Way OIL BURNERS



backed  
by

- EXCLUSIVE SALES FEATURES
- QUALITY WORKMANSHIP AND MATERIALS
- SOUND DISTRIBUTION PLAN

Backed by over 25 years of experience, Nu-Way engineers have consistently introduced advance developments in the field of automatic oil heating. High standards of production have been maintained, even during periods of material shortage, to assure the best in quality and service. The Nu-Way policy of quality production is backed by a fair distribution plan. Production is allocated to meet demands of the present list of Nu-Way distributors. As production increases Nu-Way Burners will be made available to new jobbers, distributors and dealers. Get more details now on the Nu-Way line of oil burners!

## EXCLUSIVE NU-WAY SALES FEATURES



Nozzle shield for trouble-free service. A patented Nu-Way feature.

Air adjustment for positive air control. A patented Nu-Way feature.

THE **Nu-Way**  
CORPORATION

ROCK ISLAND, ILLINOIS  
Serving Distributors, Furnace and  
Boiler Manufacturers  
Quality Oil Burners Since 1921

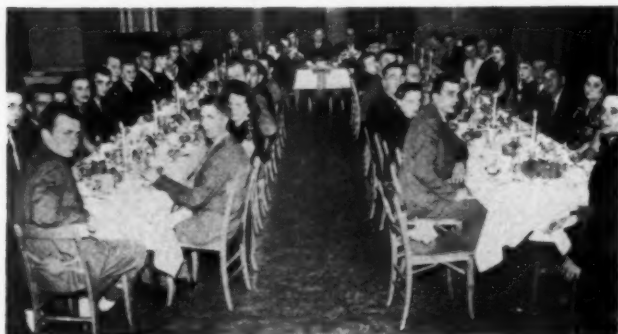


## WITH THE CONTRACTORS

### Hovland Celebrates 25th Anniversary

**H**OVLAND SHEET METAL WORKS, 318 Bellinger Street, Eau Claire, Wisconsin, celebrated their 25th anniversary recently. The employees honored A. J. Hovland and L. G. Hestekin with a banquet at the Hotel Eau Claire. The guests of honor at the head of the table included Mr. and Mrs. A. J. Hovland, Mr. and Mrs. L. G. Hestekin, and Evan Hestekin.

The following employees and their wives and friends were present at the banquet: A. M. Welland, W. E. Hestekin, R. A. Hovland, E. L. Doorn, H. V. Donaldson,



E. I. Stanton, E. C. Omdahl, C. M. Potter, O. A. Day, R. J. Hovland, W. Boehlke, C. C. Frisbie, J. Modl, I. G. Hestekin, Jr., D. F. Meindel, R. J. Kavanaugh, S. A. Olson, J. W. Hanafin, R. G. Lewis, LaVern Meindel, Robert DeMent, Arthur Druschel, Vern Potter, Donald Olson, Claude Lawler, Robert Hestekin, Arthur Tietz.

C. R. Evans, an employee, was not present.

A. M. Welland was master of ceremony. Mrs. Hovland and Mrs. Hestekin were presented with corsages. Gifts were presented to Mr. Hovland and Mr. Hestekin.

A large cake with the words "Quarter Century" was placed at the head of the table.

On March 21, 1922, A. J. Hovland started in business on West Madison Street. Five men were employed the first year. The following year L. G. Hestekin joined the firm as partner to A. J. Hovland.

In 1924, the shop was moved to 324-26 Bellinger Street. In 1938 the building at 318-22 Bellinger Street was purchased and a new shop erected on this site in 1944.

At the present time the company has 28 employees. A. M. Welland, sales manager, has been with the firm since 1929.

E. S. Piver & Son, Wilmington, N. C., has a fine plant out on the Wrightsville Beach road.

Flowers Sheet Metal Works, Wilmington, N. C., enjoys a central location and everything seemed to be going full blast.

Some of the machinery in Vic King's shop at Sanford, N. C., is so new and modern that visitors have to ask what it is for. King Roofing & Mfg. Co. really has an up-to-date setup.



*Leading the Field*

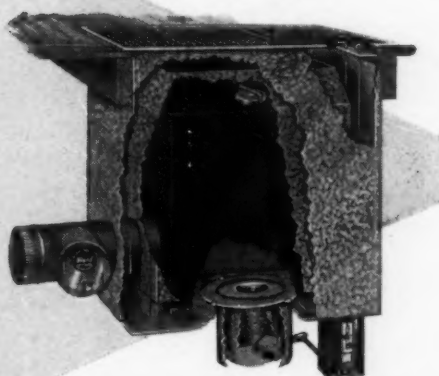
**MULKEY**

Manufacturers of  
Oil and Gas  
Floor Furnaces  
•  
Conversion Burners  
•  
Oil Trailer Heaters  
and Room Circulators



TRAILER HEATERS

FLOOR FURNACE



*Oil*

**FLOOR FURNACE**

IN THE LONG RUN

EXPERIENCE AND PERFORMANCE COUNT

WHOLESALEERS • DEALERS • BUILDING CONTRACTORS

Write or wire today for immediate delivery

**J. F. MULKEY CO.**

12626 WOODROW WILSON • DETROIT, MICHIGAN

23 YEARS OF EXPERIENCE IN DESIGN AND MANUFACTURING

Change

MINUTES

to SECONDS

with

*Riverside*

Pittsburgh  
**"DUO-LOCK"**  
Machine

Locks that used to take several minutes can now be formed in just a few seconds with a Duo-Lock. Forms Pittsburgh Locks, Double Seam Locks, Right Angle Flanges and Drive Cleats, and can be set up for two forming operations at one time. No adjustments are necessary for the different gauges making it possible for an inexperienced operator to work this machine which simply plugs into an ordinary light socket.



**RIVERSIDE MACHINERY COMPANY**

Shakopee

Minnesota

# THERE'S A Draft-O-Stat FOR EVERY REQUIREMENT

## MODEL "B" DOMESTIC — new design

The new Model "B" Draft-O-Stat represents the latest achievement in precision combustion control for the small heating plant. Adjustable counter-weighted flutter controls draft barometrically, saving fuel, reducing smoke and soot, and improving furnace operation. Two sizes, to fit flue pipes from 6" to 9".



## MODEL "A" DOMESTIC

The original Draft-O-Stat for automatic control of chimney draft in furnaces and boilers. Adjustable counterweight provides precision control of draft. Available with or without thimble. Nine sizes, 7" to 20".



## COMMERCIAL

For use in apartment buildings, hotels, schools, small factory and office buildings. Can be used on natural-draft or motor-driven oil burners, hand-fired boilers, stokers, and forced-draft installations. Available with or without hand control. Four sizes, 16", 18", 20" and 24".



## INDUSTRIAL

Sturdily built heavy-duty draft control for large heating plants. Available with or without breeching plate and thimble, and with or without locking device. Like other Draft-O-Stats, it pays for itself in most cases, out of one year's fuel savings. Three sizes — 24", 30" and 36".

*Write for descriptive literature*

**THE HOTSTREAM HEATER CO.**

**6917 Quincy Avenue • Cleveland 4, Ohio**

*Manufacturers of water heaters and draft controls*

## WITH THE MANUFACTURERS

New offices and a large addition to the existing warehouse facilities at E. 53rd St. and Lakeside Ave., Cleveland, have recently been completed by Joseph T. Ryerson & Son, Inc., distributors of steel from stock.



Construction of the new unit, a brick and concrete structure over a steel framework, was started in 1946 with the demolition of a portion of the old warehouse which had outlived its usefulness. The new building, fronting 165 ft. on Lakeside Ave. and extending to a depth of 330 ft. on E. 53rd St., provides 80,000 additional square feet of heated warehouse space and approximately 13,000 square feet of space in which is housed the company's new offices. Total floor area of the entire property is now about 250,000 square feet, making this the largest steel-service plant in the Cleveland area.

William O. Springer, plant manager, said that the new unit would be used largely to warehouse stocks of alloy and carbon steel bars, mechanical tubing and sheet steel. The company distributes a complete line of hot rolled, cold finished, stainless, alloy and specialty steels in a wide range of sizes, shapes, finishes and conditions.

To co-ordinate all field sales activities for the Evans line of oil-burning automatic water heaters and space heaters, Georges Faurie has been appointed general sales manager for the Heating and Appliance Division, Evans Products Co., Plymouth, Mich.

Associated with sales and related promotional activities for over 20 years, Faurie attended the Colorado School of Mines and received his degree from the University of Wyoming in 1926.

Mr. Robert E. Hollinshead, formerly with the Carrier Corporation, has joined the Surface Combustion Corporation as assistant sales promotion manager of the Janitrol Division.

Mr. Hollinshead will develop, produce and conduct the sales training and sales promotion activities for this division.

## Extra Profits In Blower Installations

with

# Vent-Air

General Purpose  
**CAST ALUMINUM  
UTILITY BLOWERS**

V-5—6" (less motor) - - - \$19.00 Net

V-10—7" (less motor) - - - 24.00 Net

V-20—9" (less motor) - - - 36.00 Net

| SIZE | INLET | OUTLET | WHEEL DIA. | CFM  | REC<br>RPM | REC<br>HP |
|------|-------|--------|------------|------|------------|-----------|
| V-5  | 6"    | 6"     | 6 1/4"     | 550  | 1750       | 1/4       |
| V-10 | 7"    | 7"     | 7 1/4"     | 1180 | 1750       | 1/2       |
| V-20 | 9"    | 9"     | 9 3/4"     | 2280 | 1750       | 3/4 or 1  |

Blowers are of light weight, sturdy, cast aluminum—non-sparking. Standard diameter inlet and outlet—fit stock size pipe. Adjustable base—fits any standard motor. Adjustable discharge—rotates to four positions. Wheel statically balanced.

We Can Supply Motors for Each Unit, If Desired

**MAXIMUM AIR DELIVERY • MINIMUM OVERALL SIZE AND WEIGHT**



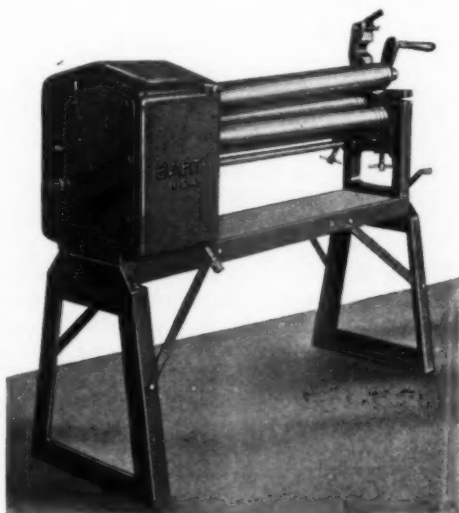
Installed with used or new motors—VENT-AIR provides a compact, efficient blower set that permits you to make a good profit for your time and trouble. Order a VENT-AIR today. Send purchase order or cash. Shipped F.O.B. Detroit.

## Fried Air-Kool Co.

8205 LYNDON  
DETROIT 21, MICH.

# BARTH

## MODERN METAL WORKING EQUIPMENT



Four Inch Forming Rolls

BARTH sheet metal working tools keep step with every major stride of the industry. When you install one, you make a definite contribution to progress. You meet a modern need with a modern tool! Write for latest catalog.

## PRODUCTS

Foot Squaring Shears  
Foot Gap Shears  
Bar Folders  
Forming Rolls  
Slitting Shears  
Bar and Rod Shears  
Combination Deep Throat  
Bench Machines  
Wiring Machines  
Edging Machines

Turning Machines  
Burring Machines  
Flanging Machines  
Crimpers and Beaders  
Brace and Wire Benders  
Bench Plates  
Cast Iron and Steel Stakes  
Rivet Sets  
Toolmakers' Drill Stands  
Hand Groovers

**THE BARTH MANUFACTURING CO., MILDALE, CONN., U. S. A.**



## WITH THE MANUFACTURERS

Organization of a new subsidiary company in Switzerland has been announced by Harold W. Sweatt, president of the Minneapolis-Honeywell Regulator Company.

Named Honeywell A. G., the new company has started operations with completion of legal formalities and the hiring of operating personnel. The Swiss organization will handle sales and service of the complete line of Honeywell controls as well as all of the industrial recording and controlling devices made by the Brown Instrument Company, wholly-owned Honeywell subsidiary.

Intensified interest in automatic heating as well as growing industrial activity in Switzerland were cited by Sweatt as reasons behind the formation of the new company.

Charles B. Meech has been transferred to Zurich as manager of the subsidiary company. Leo deBruyn, a member of Honeywell's international division, will assist Meech. Other members of the Zurich staff are natives of Switzerland.

Other foreign subsidiaries operated by Honeywell are located in England, Sweden, Holland, Belgium and Mexico.

Mid-West Sales Engineers, Inc., Indianapolis, Indiana, has been appointed manufacturer's representative for Nu-Way "XL" line of oil burners. Mid-West will represent Nu-Way in southern Illinois, all of Indiana, Ohio and Kentucky.

L. E. Wood, president of Mid-West has been a manufacturer's agent for 21 years, representing a number of leading manufacturers. During the war he was a specification engineer on the jet engine for the Allison division of General Motors.

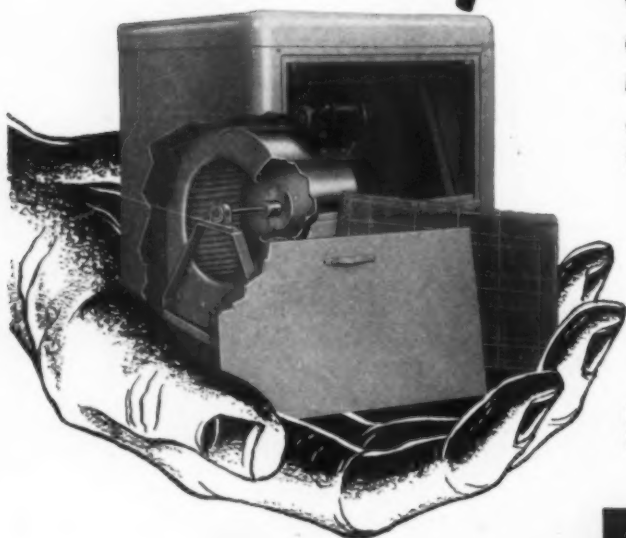
In order that Oil-O-Matic dealers and their service personnel might have the benefit of factory sales and service training even when they are at their busiest with oil burner installations, the Oil-O-Matic Division of the Eureka Williams Corporation has recently been sending sales and service experts into the field for regionalized meetings.

Regis Plante, who conducts factory retail sales and sales management clinics for the Oil-O-Matic Division has arranged for 22 field meetings to date.

Appointment of Crawford-Mazer, Inc., Detroit, as sales agents for all Hussey Copper and Brass products in the Detroit territory has been announced by C. G. Hussey & Co., Pittsburgh. Sales offices of Crawford-Mazer, Inc., are located in the Fox Building, Detroit. The Hussey line of copper and brass products includes sheet, strip, coils, rod and tubing, nails, and fabricated building products.

# Brundage GIVES YOU . . .

- QUIET OPERATION
  - DEPENDABLE PERFORMANCE
  - EASY INSTALLATION
- IN SERIES 200 AND 300 BLOWER CABINETS



Send for complete description and specifications of Series 300, The Economy Unit, and Series 200, the DeLuxe Unit, Brundage Blower Cabinets.

You get quiet operation in a Brundage Blower Cabinet because the blower is designed right and made carefully of high quality materials. The fan wheel is hot riveted to the hub and the blades are hot riveted to the wheel. The shaft runs in self-aligning pillow blocks making the whole assembly rigid, smooth-running and vibrationless. Nationally known makes of motors are used.

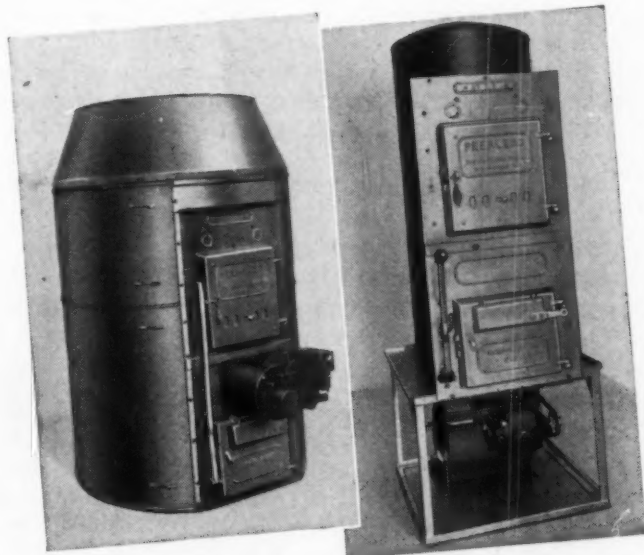
And you know that when you install a Brundage Blower, it will continue to give quiet, dependable service for years to come because Brundage uses heavier materials, designs Brundage Cabinets for greater strength and longer life. Better construction makes Brundage Cabinets easier to install, too, because dimensions are accurate and all parts fit together easily. Install Brundage for customer satisfaction and greater profit.

THE  
**Brundage**  
COMPANY

*Blower Specialists*  
*Since 1919*

504 NORTH PARK STREET  
KALAMAZOO 11, MICHIGAN

# TWO NEW PEERLESS FURNACES



COMBINATION

HIGH-BOY

At left: The Peerless Combination, with automatic Breese oil burner installed. Even with burner installed, if need be it can be fired with coal.  
At right: The Peerless High Boy with case removed. Dimensions, 27" x 30". Height, 6'. For utility room use here's your best buy.

## IDEAL FOR SMALL HOMES!

Here are the two latest Peerless Steel Furnaces for use in the smaller home . . . *designed* to sell fast and serve efficiently . . . *priced* to build bigger-than-ever profits for you! Engineered and built by Peerless master craftsmen, these all-new warm air heating units are:

**THE PEERLESS HIGH BOY**—Designed for utility room or where space is limited. Blower at bottom forces all available heat up through warm air registers. Oil burner can easily be installed for automatic heat.

**THE PEERLESS COMBINATION**—For either coal or oil operation. Can be hand-fired even with burner installed. Combustion chamber and radiator of arc-welded, steel boiler plate assures peak heating efficiency and maximum life. Economical, dependable, easily installed.

Write or wire for full specifications, prices and other details on these and the many other fast-selling, efficient furnaces in the complete Peerless line!

## PEERLESS FOUNDRY COMPANY

1853 Ludlow Ave. • Indianapolis, Indiana

## Save Installation Costs WITH No. 40 BASEBOARD REGISTERS

Built to save many High-Priced minutes on every register installation. The U.S. No. 40 Series can be an important part of any profit program. The *two-piece* construction simplifies attaching frame to stackhead—assures a *leak-proof* fit. On all jobs, U.S. *turn-button lugs* are *stronger than screws* for drawing center to frame. **THERE ARE NO LOOSE SCREWS** to be lost when installing. Millions of U.S. No. 40 Gravity Baseboard Registers in use have proven the many superior features of this popular favorite.



The No. 40 is a beautiful unobtrusive register. It comes in all standard baseboard sizes with standard base extensions. Note how the grille bars, from normal position, will hide the interior—yet they provide full free area. They are very practical for converting Gravity to Forced Air Systems. See the catalog for complete details and finishes.

Send for Catalog No. 47 for complete Gravity and A-C lines.



# UNITED STATES REGISTER CO.

BATTLE CREEK, MICHIGAN

MINNEAPOLIS

KANSAS CITY

ALBANY



why sacrifice **QUALITY**

for **PRICE**

WHEN RUDY GIVES  
YOU BOTH

Rudy's all cast Lifetime Oil Heat Air Conditioner costs only slightly more than less efficient units constructed from lighter, less rugged materials.

Increasing numbers of dealers the country over are turning to Rudy Lifetime quality because the greater customer satisfaction obtained contributes to increased profits.

OIL, GAS and  
COAL-FIRED  
FURNACES

GET THE FACTS

TODAY—Use the coupon below

.....

Please send me complete information on the Rudy Life time oil heat air conditioner.

Name .....

Address .....

City ..... State .....

.....

RUDY FURNACE COMPANY

E. PRAIRIE RONDE ST.

• DOWAGIAC, MICHIGAN

## WITH THE MANUFACTURERS

Otto H. Demmler has announced his retirement as president of Demmler Bros. Company, Pittsburgh, Pa., distributors of sheet metals, roofing supplies, heating and air conditioning equipment. Mr. Demmler, who has been associated with this 86 year old firm for the past 59 years, will continue on the board of directors and will serve as consultant to the company's new management.

The company's directors have appointed to the presidency Louis F. Demmler, formerly director of research and merchandising for Ketchum, MacLeod & Grove, Inc., Pittsburgh advertising agency.

Erling E. Olsen of Portland, Oregon has joined the Harvey-Whipple field sales force, will cover the states of

Oregon, Washington, and Northern Idaho, contacting Master Kraft dealers already in those states, and establishing new accounts.



Erling E. Olsen

Mr. Olsen has had a wide experience in the heating and appliance fields, has for the past ten years covered the Northwest for J. E. Hasletine Company, established dealers.

Approximately 450 distributors and salesmen from all sections of the United States and Canada attended the "housewarmings" held by Duo-Therm Division of Motor Wheel Corporation September 5, 8 and 12 in Lansing, Michigan, where they were taken on a conducted tour through the huge, new Duo-Therm plant and told of the company's sales and promotion plans for its complete line of fuel oil appliances.

Each meeting was a two day affair with the first day being devoted to the trip through the plant and a series of discussions by Duo-Therm officials.

R. H. Reeder, Duo-Therm sales manager, led off the program with a review of the fuel oil appliance line and its outstanding features. High lighting Mr. Reeder's discussion was the presentation of Duo-Therm's complete new line of gas water heaters.

Following this came the tour of the new plant. Laid out with an eye to providing a precision, straight line manufacturing operation and equipped with the most modern production machinery, this plant is said to represent a \$3,000,000 investment by Duo-Therm.

The second day was given over to a short course in the Duo-Therm factory service training school. Here distributors were given a streamlined course in the proper methods for installing and servicing Duo-Therm space heaters, water heaters and furnaces.



# SAVE TIME AND EFFORT

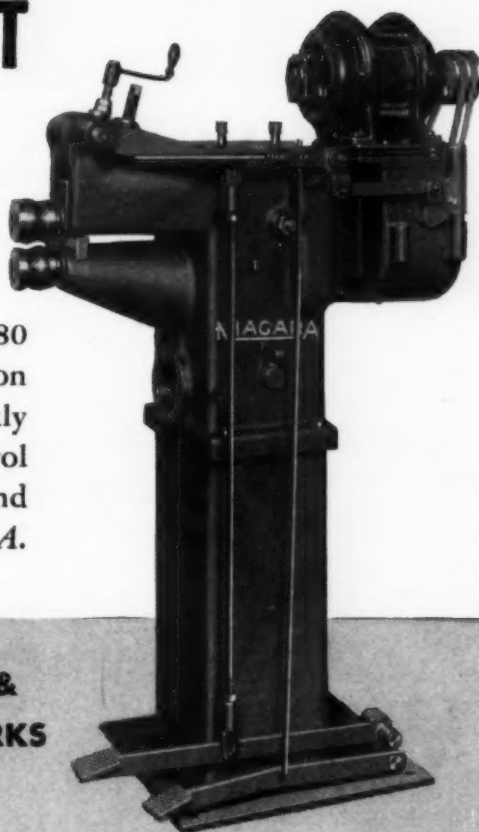
## ON HEAVY GAGE JOBS

*Burring, Turning, Wiring, Beading, Crimping,  
Flanging, Slitting, Circle-cutting*

Powerful and Productive...this No. 180 NIAGARA Motor-Driven Combination Machine turns out heavy jobs quickly and with minimum effort. Foot control permits use of both hands to hold and guide the work. *Write for Bulletin 75A.*

**NIAGARA** MACHINE &  
TOOL WORKS

BUFFALO 11, NEW YORK  
*District Offices... New York... Cleveland... Detroit*



## PRESENTING THE MIDCO

### *Fully Automatic Oil Burner*



Adaptable for use in new buildings or converting hand-fired heating plants to automatic heat.

Here is the burner that will build sales for you in every type of installation, conversion or new heating plant. Sound combustion research and realistic engineering have joined to give the new Midco burner three outstanding features—

**ECONOMY**—exact mixture of oil and air give most possible heat out of each drop of oil. Replace those extravagant burners with the fuel-saving Midco.

**SILENCE**—The homeowner wants an oil burner but doesn't want to hear it. "Quiet as a Midco" has become the watchword of the industry.

**DURABILITY**—Service calls are annoying to dealer and customer alike. Precision machining and quality merchandise make a Midco installation a long and trouble-free one. We will be glad to tell you how to

"Make money with Midco!"

**THE MIDCO MANUFACTURING COMPANY**

1134 West 79th Street

Chicago, Illinois

## WITH THE MANUFACTURERS

W. C. Newberg has been appointed president of the Airtemp Division of the Chrysler Corporation to succeed D. W. Russell, who is retiring after holding the position of president for the past eight years.

Mr. Newberg has been with Chrysler Corp. for fourteen years and during the war he was chief engineer of the Dodge-Chicago Plant, where many difficult production problems were encountered in the production of engines for B-29 bombers. The results achieved on this assignment might be partially due to the training Mr. Newberg had received within the Chrysler organization after his graduation from the University of Washington with an engineering degree. When he joined Chrysler he spent two years in the Chrysler Institute to get his Master's Degree in Mechanical Engineering.



W. C. Newberg

Frank N. Parker has joined the Dowagiac Steel Furnace Co., Dowagiac, Mich., as merchandising manager. For many years Mr. Parker had been associated with

the Round Oak Co. as sales manager of that organization.

Ward Leonard Electric Co., 31 South St., Mount Vernon, New York, has appointed W. R. L'Hommedieu as sales representative in the Los Angeles area. Mr. L'Hommedieu is located at 722 E. Washington Blvd., Los Angeles.

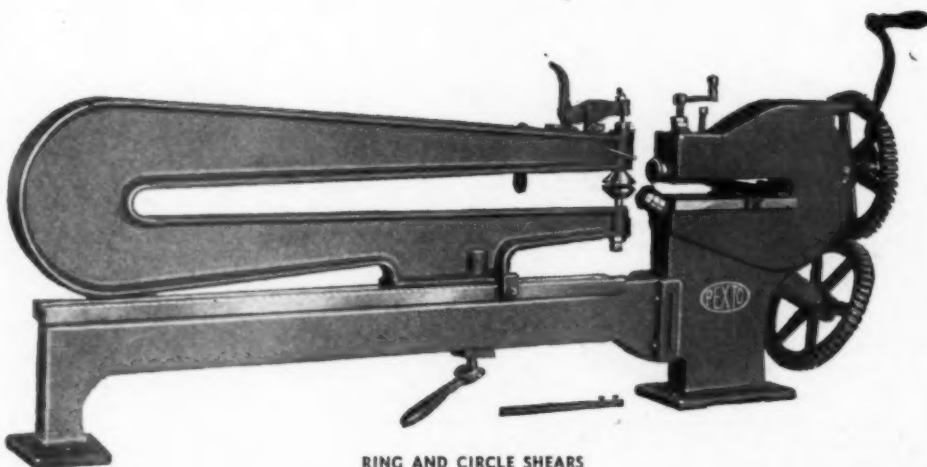
J. F. Kotchevar and J. H. Reichwein, who were formerly chief engineer and general superintendent of the Janette Mfg. Co., have announced their affiliation with Revco Engineering and Mfg. Co., 3227 W. Carroll Ave., Chicago. This company specializes in blower wheels for oil burners, stokers and blowers for winter air conditioning systems.

Coincidentally with completion of construction of a large addition to its plant, announcement is made of the appointment of Charles J. Kolb as manager of industrial relations according to a statement by Frederick E. Munschauer, president of Niagara Machine and Tool Works, Buffalo, N. Y., manufacturers of machinery and tools for fabrication of sheet metals. Mr. Munschauer said, "In line with the expansion of both plant facilities and organization and with continued appreciation of the importance of good industrial and labor relations, we feel fortunate in securing Mr. Kolb who has had many years of experience in this field."

He was director of industrial relations with the Pierce-Arrow Motor Car Co. from 1910 to 1935 and director of industrial relations with the Colonial Radio Corp. from 1935 to 1947.

# PEXTO MEANS SHEET METAL WORK AT ITS BEST

Smooth, accurate response to controls and delivery of maximum power gives the operator of PEXTO Machinery exactly what he needs for superior work. There's a type for every need . . . with many years of experience to back it up. You are safe in saying "PEXTO."

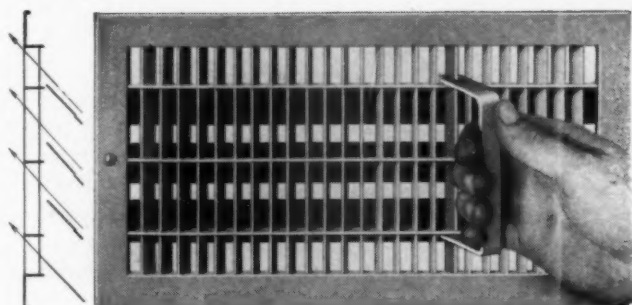


RING AND CIRCLE SHEARS

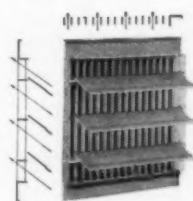
THE PECK, STOW & WILCOX COMPANY Since 1785 SOUTHLINGTON, CONNECTICUT, U. S. A.

# INDEPENDENT

## "Fabrikated" WALL GRILLES WITH DEFLECTING VANES



Style 321-A grille  
with deflecting vanes



Rear view showing  
adjustable deflect-  
ing vanes



**A**CCURATE and positive com-  
pound deflection of air flows  
can be readily secured with these  
"Fabrikated" grilles. Directional ad-  
justments may be made when grilles  
are installed; or grille bars and vanes  
may be adjusted after installation  
to meet unforeseen or changed  
requirements.

Each grille bar and each deflecting  
vane is adjusted *individually* with  
a special two-pronged tool included  
with each shipment. Locking of  
grille bars and vanes is not required  
because they are held firmly in  
place — no vibration — no rattle.  
Write for complete details.



*Always Leading — Always Progressing*

### THE INDEPENDENT REGISTER CO.

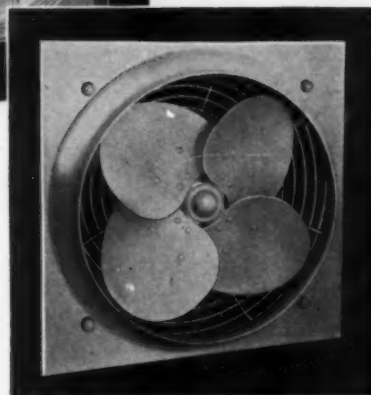
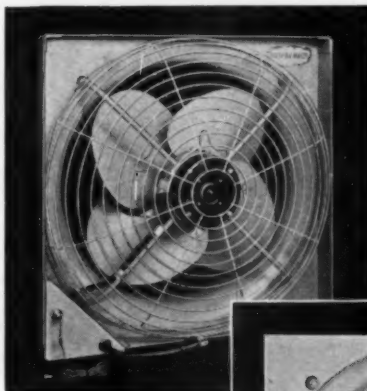
3747 E. 93rd STREET • CLEVELAND, OHIO

## Fresh-Air-Maker direct driven Exhaust Fans

★ ★ ★ Three fine models—12", 16", 20" have  
been added to the famous Fresh-Air-Maker line

and are ready  
for immediate  
delivery.

★



• 12"  
• 16"  
• 20"

All 3-SPEED fans—fine performers with high air  
delivery and surprisingly quiet operation. They are  
attractive in design and beautifully finished all over  
in ivory. Complete with cord and plug and con-  
venient 3-speed pull switch so fan can be located  
high up and speed controlled if desired. Wire guards  
and manually operated louvers optional.

FRESH-AIR-MAKER, QUALITY • MATERIAL •  
WORKMANSHIP • PERFORMANCE • PRICED RIGHT

★

WRITE FOR PRICES — IMMEDIATE DELIVERY  
New Literature

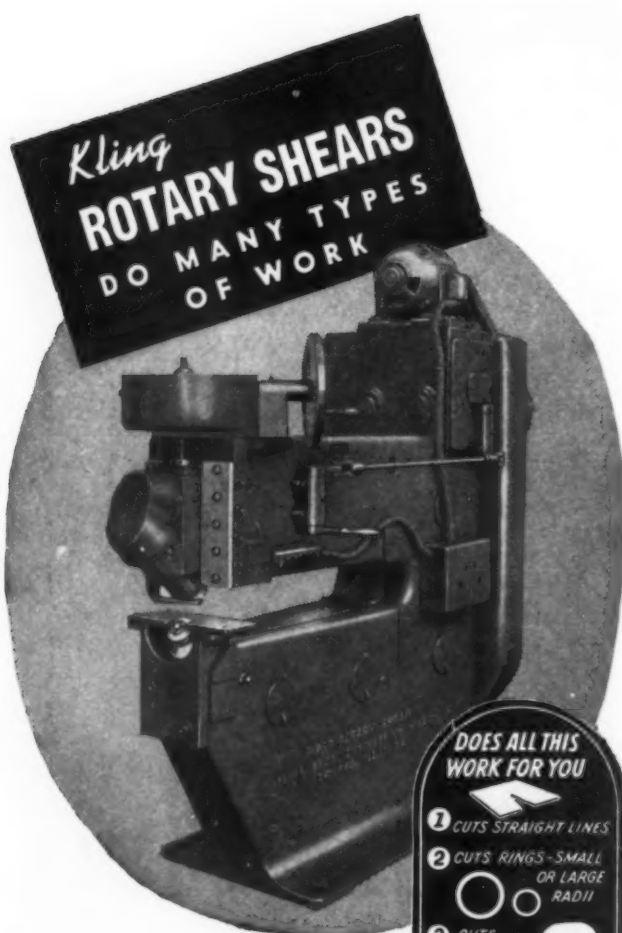
### SCHWITZER-CUMMINS

Ventilating Division

1145 E. 22nd STREET • INDIANAPOLIS 7, INDIANA

- BLOWERS
- VENTILATORS
- BLOWER WHEELS





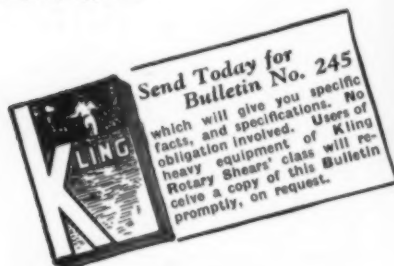
## Yes, and With Hairline Precision

Rapid operation . . . Hairline Accuracy . . . the use of Kling Rotary Shears marks the latest development in cutting mild steel, and sheet metal, up to 1-inch with amazing savings in time, labor, and production costs.

For exacting projects (see illustration at the right), no single unit of metal-working equipment does so many different things so cleanly and efficiently as does the Kling Rotary, pictured above.

In metal-working plants, automotive, aviation, home appliance, and other industries, where work of this character is being done,—this machine is held in high regard for its versatility and economy of operation.

This great usefulness is the result of half-a-hundred years of engineering experience which prospective buyers, with reason and respect, applaud.



## KLING BROS. Engineering Works

1322-HV No. Kostner Ave., Chicago 51, Illinois  
EXPORT DEPT. 1111 South Ferry Building, New York 4, N. Y.

### DOES ALL THIS WORK FOR YOU

- 1 CUTS STRAIGHT LINES
- 2 CUTS RINGS—SMALL OR LARGE RADIUS
- 3 CUTS CIRCLES
- 4 MAKES FLANGES
- 5 CUTS INSIDE HOLES WITHOUT CUTTING IN FROM EDGES
- 6 JOGGLES & OFFSETS
- 7 CUTS ODD SHAPES
- 8 BEVELS OF ANY ANGLE
- 9 CUTS REVERSE CURVES
- 10 BEADS & U'S

ALL WITH  
*Hairline*  
PRECISION

## Kruckman— Washington Letter

(Continued from page 69)

This appointment came as a surprise to some who had expected the accession of Gen. Lawton Collins to the post. An advocate of rigid regimentation and military conscription, Gen. Collins had seemed to be in line for the job in spite of Bradley's firmer claim to top position in the Army.

There is a strong and substantial element in Congress, and apparently elsewhere, who earnestly believe the supendous crash must come sooner or later as the result of the disorganization of the world; that this disorientation is absolutely unavoidable in the end, and that it may be better to let it come now, rather than later. They think we have reached the end of a millennium, and that we are feebly trying to fend off the inevitable death throes.

### Our Surpluses Drained Off?

There is still another group which holds that the relief we may give to Europe and Asia must be of such volume, and be extended over such a length of time, and in effect be so futile, that the deprivations we will suffer, by direct and indirect reactions, will gradually take away from us so many supplies that our way of life will be changed. They think we will be compelled to do with less, reduce the scale of our living, and permit the standards of our living to be materially and permanently lowered. For instance, off the record, you hear here that for the next 5 to 10 years we must supply the rest of the world with 7% to 10% of the steel we produce. This patently means that a huge slice of our industry dependent on steel must quit, if it cannot get other metals as substitutes. And since we know from experience, during the war, that scarcity of one material almost immediately starts a run on another, that gradually throws the whole program out of kilter, it becomes plain there is no remedy in substitutes. We hear that if the European Relief Program is actually carried out as proposed it may be necessary to send as much as half of our steel sheets and strip abroad in one form or another.

### Effect of Tariff Reduction

It is also pointed out by Senator George W. Malone, of Nevada, that the network of trade agreements negotiated by the Department of State, which in most instances have cut our imposts 50%, have opened our markets to the goods produced in countries with much lower standards of living and lower wages, and whose producers therefore may now flood our markets with a competition we cannot meet unless we can reduce wages and cut the cost of production. The reduction in duties is defined by the Department of State, and others, as a part of our effort to bring relief to those peoples of the world who have no dollars to buy our goods, which they need. The effect is that we permit them to send their cheaper goods to our markets to get our dollars so they may buy from us the goods we will be forced to make more cheaply by reducing wages and living standards in order that we may bring them relief and sell our goods. The whole tendency seems to be to depress our standards. The program has a curious appeal to the two extremes of current socio-

## Why Dealers like this KRESKY OIL FLOOR FURNACE

*First*, exclusively designed Kresky mechanical air induction gives a constant *clean hot flame* regardless of draft.

*Second*, the Kresky economical "Hi-Lo" pilot control provides steadier heat... no cold starts.

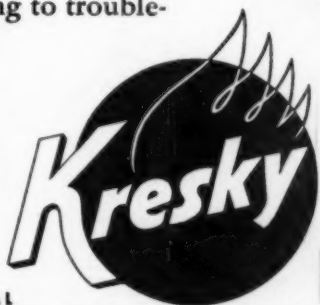
*Last but not least*, Kresky is the nearest thing to trouble-proof... it even operates when current goes off. \* Dealers are invited to write for franchise proposition.

**KRESKY MFG. CO., INC.**

*Pioneers in Oil Burning Equipment Since 1910*

PETALUMA • CALIFORNIA

HEATING • COOKING • HOT WATER • INDUSTRIAL



*Oil*  
**BURNERS**

Listed by  
Underwriters',  
Laboratories, Inc.



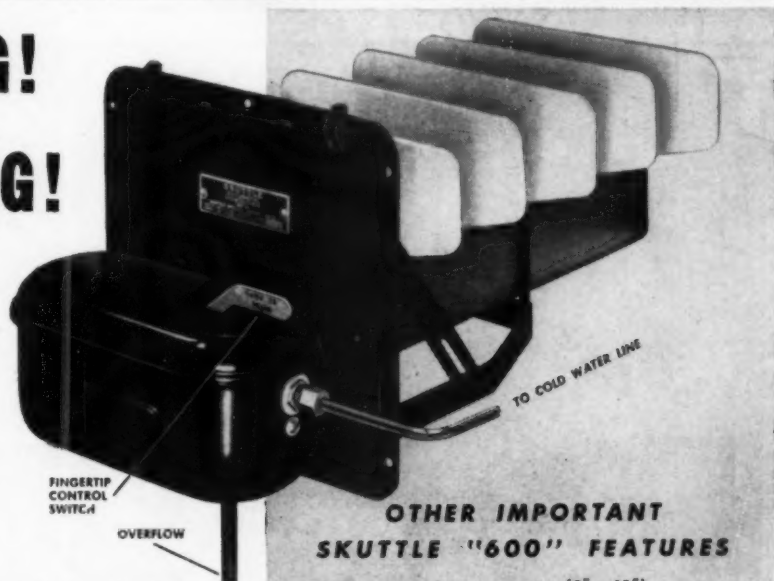
## *Self* FLUSHING! *Self* CLEANING!

### **AUTOMATIC CLEANING NOW POSSIBLE IN THE NEW SKUTTLE HUMIDIFIERS**

It's TRUE! Skuttle Automatic Humidifiers (Series 600\*) are completely self-flushing, completely self-cleaning! All you do is raise the fingertip control switch to flushing position and Skuttle's new exclusive vacuum-controlled cleaning system does the rest... flushes the entire unit, drains off all water, sludge, mud and mineral deposits, then automatically trips off to allow unit to refill again to valve adjustment level! No hand scraping required, no clean-out panel necessary! Simple, convenient, foolproof!

*The series 600 saves you installation time over any other type of humidifier.*

\*Patents Pending



### **OTHER IMPORTANT SKUTTLE "600" FEATURES**

- ★ Drawn seamless copper pan (3" x 12").
- ★ Replaceable VAPOGLAS® evaporating plates.
- ★ 5 plates furnished. Evaporating area 316 sq. in.
- ★ Automatic anti-siphon float control valve.
- ★ Collar fits sloping or vertical bonnets.

See your local jobber or write today for state listings and the complete Skuttle story!

# Skuttle

**MANUFACTURING CO.**  
4099 BEAUFIT, DETROIT 7, MICHIGAN

## SHEET METAL MACHINERY



MODEL "S" (PORTABLE)  
Forms Pittsburgh Locks, Acme Locks and  
Drive Cleats

### SEE US FOR

Pittsburgh Lock Machines, Roll Forming Machines, Roller Dies, Pipe and Elbow, Beading, Turning Machines and all other Sheet Metal Working Machinery.—Your inquiries invited.

**MAPLEWOOD MACHINERY CO.**

2634 FULLERTON AVE.

CHICAGO, ILL.

economic and political ideologies. Our New Dealers, who blend into the Social Democracy of Britain and into the Communism of Russia, honestly think it is essential we should bring down our standards in order to lift the standards in those areas of the world where the levels are low. The President's plans for controls are attributed to this group, headed by several former directors of the OPA in its most lively days. On the other hand, the second group, the most conservative element of what for the want of a better term we call Big Business, also believe in those controls which will introduce foreign competition, open foreign markets, and reduce wages here, and place tighter reins on Labor Unions, and place a containing wall around Smaller Business.

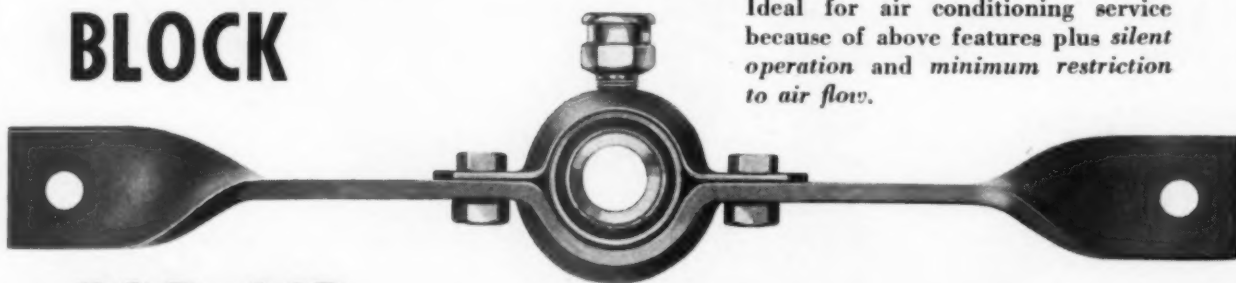
Meanwhile, the Russians are assumed to be watching what is happening here with eagle eyes, waiting for the depression which will cause the debacle that will make us more amenable to the doctrines of Communism, or make us a more easy conquest. The quadrennial election year ahead affords the political genius of this country tremendous opportunity. It is a challenge to great patriotism as well as to great intellect. Thus far Washington has not become aware of any person with the quality of epochal leadership which seems to measure into the stupendous job. There are those here who wonder if any human being is big enough to fill the space.

It may be interesting to conclude this Letter with the closing words of the President's report to the Congress:

## THE IDEAL PILLOW BLOCK

**U**NIQUE engineering encloses Bushing, Cushion and Sealed Oil Reservoir in compact pressed steel ball. Perfect self-alignment through ball and socket action. Built-in oil-proof synthetic rubber cushion absorbs vibration. Porous bronze bushing, wick fed from large oil chamber, insures long-time lubrication.

*Ideal for air conditioning service because of above features plus silent operation and minimum restriction to air flow.*



## FOR AIR CONDITIONING

This bridge tree is one of several types of mountings. We are glad to cooperate with engineers in designing mountings to meet their specific needs. Tell us your problems and we will send illustrations, specifications, and complete information.

**TRIANGLE MANUFACTURING CO.**

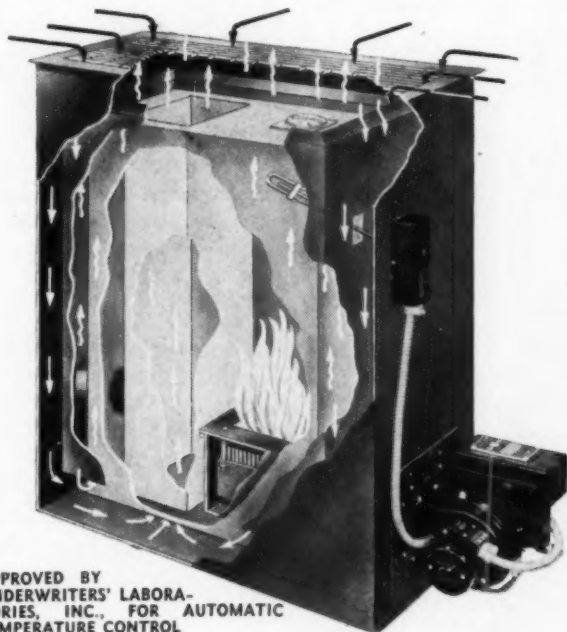
392 Division Street

Oshkosh, Wisconsin



# ROBERTS *Automatic Oil* FLOOR FURNACE

*The Last Word in*  
**MODERN HEATING**  
*for SMALL HOMES*



APPROVED BY  
UNDERWRITERS' LABORA-  
TORIES, INC., FOR AUTOMATIC  
TEMPERATURE CONTROL

SPECIALLY DESIGNED BURNER, COVERED BY PATENT APPLICATION, THAT HAS A NON-IMPINGING FLAME, REDUCING CARBON TO A MINIMUM AND ELIMINATING THE NECESSITY OF CARBON CLEANING.

- BURNS NO. 3 OIL OR BETTER
- AVERAGE INSTALLATION 4 HOURS OR LESS (2 MEN)
- NO BASEMENT REQUIRED

Shipped as a complete unit . . . Automatic thermostatic control standard equipment. Model AK-101, 52,000 BTU. Width 14", Length 30", Depth 35". Flue Pipe 6" diameter. Draft required, .05" water column. Heavy steel electric-welded heat exchanger. Grill, oak finish. Rust and corrosion-resistant casing and air separator. Shipping weight 165 lbs. Draft booster blower.

*A Limited Number of  
Dealer Franchises Available*

## ROBERTS FURNACE

DIVISION OF BONE TOOL & GAUGE COMPANY

380 Twenty-Fourth St.

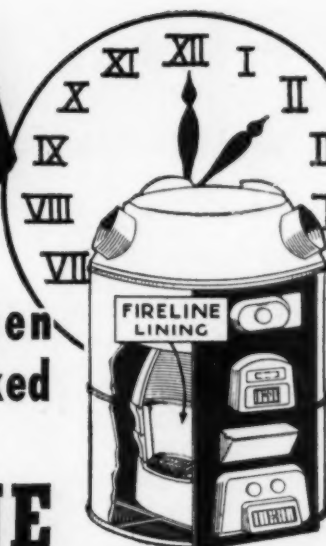
Detroit 16, Mich.

AMERICAN ARTISAN, December, 1947

**HOURS  
NOT  
DAYS**

are all  
you need when  
you fix a cracked  
firepot with  
**FIRELINE**

**—and it is completely, durably renewed!**



There's no need to dismantle the furnace, or wait for castings. The whole job can be done in a few hours. Fireline is a means of completely renewing the firepot—a high-quality refractory moulding material in moist, plastic form which forms a complete lining entirely around the inside of the castings. The fire bakes it into a durable, one-piece lining that withstands temperatures up to 3000 deg. F.—a far higher temperature than ever occurs in a domestic furnace.

You install Fireline easily and quickly through the furnace door. Just pound it into place with a hammer, then trim it smooth. That's all there is to it. There's nothing to mix, nothing to add. Fireline seals all cracks and holes in the firepot castings; stops leakage of gas, odors, soot into the building. Fireline also preserves firepots still in good condition and improves combustion efficiency by reflecting and radiating heat across the entire firebed.

With Fireline you can handle more repair jobs. You save your customers money. You make a higher profit percentage.

Ironset Asbestos Furnace Cement—the high-quality cement for setting up new furnaces and re-cementing old ones. Withstands higher temperatures. Will not crack, shrink, bloat, or blister. Makes your work more permanent. Try it on your next job and see how Ironset builds up your reputation for permanent, gas-tight work. You can't afford to use any cement but the best—and that means Ironset.



Fire-Hearth Castable—the ideal refractory for setting stokers, forming precast combustion chambers and baffle tile. Easily installed: Just mix with water, pour into place, and trowel smooth. That's all there is to it.



Fireline heating specialties are carried by leading jobbers. Write for free descriptive literature, prices, and discount.

**FIRELINE STOVE & FURNACE LINING CO.**  
1816 N. Kingsbury St., (Dept. L.), Chicago 14, Ill.

# FIRELINE

HEATING SPECIALTIES

## EASY EXTRA PROFITS on every Automatic-Heat installation

**Lowest Cost**  
**HOME INCINERATION**  
**available!**

Low cost and "self-burning" action bring quick sales for this easy-to-install incinerator—especially where automatic heating prevents rubbish-burning in the furnace! Burns wet or dry garbage and rubbish; advanced down-draft action dries the waste constantly. Contents need be ignited only once or twice a week; ashes removed only once or twice per month. Unit is only 2 feet in diameter, less than 3 feet high! Uses any 8-inch flue; will not affect heating-plant efficiency if tapped to furnace flue. Handsome silver-and-blue duotone finish! Write for details!

**The Majestic Co.**  
842 Erie Street  
HUNTINGTON, INDIANA

**Majestic**  
**No. 30 FUELLESS**  
**HOME**  
**INCINERATOR**



*Nationally Advertised Home Necessities for Over 40 Years.*

"In summary, the immediate anti-inflation program that I recommend calls for the following legislative action:

"One: to restore consumer credit controls and to restrain the creation of inflationary bank credit.

"Two: to authorize the regulation of speculative trading on the commodity exchanges.

"Three: to extend and strengthen export controls.

"Four: to extend authority to allocate transportation facilities and equipment.

"Five: to authorize measures which will induce the marketing of livestock and poultry at weights and grades that represent the most efficient utilization of grain.

"Six: to enable the Department of Agriculture to expand its program of encouraging conservation practices in this country, and to authorize measures designed to increase the production of foods in foreign countries.

"Seven: to authorize allocation and inventory control of scarce commodities which basically affect the cost of living or industrial production.

"Eight: to extend and strengthen rent control.

"Nine: to authorize consumer rationing on products in short supply which basically affect the cost of living.

"Ten: to authorize price ceilings on products in short supply which basically affect the cost of living or industrial production, and to authorize such wage ceilings as are essential to maintain the necessary price ceilings."

*There's no job too difficult for*  
**FOLLANSBEE**  
**SEAMLESS TERNE ROLL ROOFING**



Flashing around chimney and parapet wall with a standing seam roof.

DETAIL

Round Dormer - Boxed  
Gutter & Leader Head.

In fact, you can do a better job with FOLLANSBEE SEAMLESS TERNE ROLL ROOFING regardless of structural conditions or roofing specifications.

You can cut any desired length from the 50-foot rolls of Follansbee Seamless Terne Roll Roofing right on the job. And, it's easy to handle because of the uniform straight edges.

You'll find it advantageous to use Follansbee Seamless Terne Roll Roofing on your next maintenance or repair contract. Your Distributor is receiving periodic allocations of Follansbee Seamless Terne Roll Roofing—why not call him today?

Stocked, As Available,  
by Leading Distributors



**FOLLANSBEE STEEL CORPORATION**

GENERAL OFFICES - PITTSBURGH 30, PA.

Sales Offices—New York, Philadelphia, Rochester, Cleveland, Detroit, Milwaukee. Sales Agents—Chicago, Indianapolis, St. Louis, Kansas City, Nashville, Houston, Los Angeles, San Francisco, Seattle; Toronto and Montreal, Canada. Plants—Follansbee, W. Va., and Toronto, Ohio.

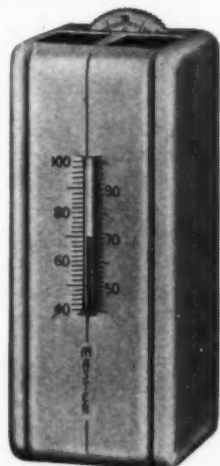
Follansbee Metal Warehouses—Pittsburgh, Pa., Rochester, N. Y., and Fairfield, Conn.

ELECTRICAL SHEETS • POLISHED BLUE SHEETS • SEAMLESS TERNE ROLL ROOFING • COLD ROLLED STRIP

# MASTER

TEMPERATURE CONTROLS

## Earn their Reputation

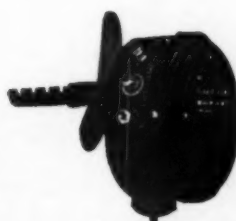


**A-23 Plain  
Thermostat**

The policy of taking more pains than seems necessary in the manufacture of each individual part and inspection and test of each unit, pays in customer satisfaction . . . For this reason "Master" Controls are specified as replacements, and in more and more new construction.

as instruments by rendering precision-performance—every one!

Over a quarter century of knowing how and doing well has raised the name "MASTER" to a high position in the industry—a standard of long life, comfort and economy for your customers—friends and future sales for you.



**D-22A  
Regulator  
Switch**



**B-22 Motor**

Specify and install "Master". It is more than a name. It is a guarantee.

The B-22 Master Control Motor is silent—powerful—low in current consumption.

They are available now for your installations.

**WHITE MANUFACTURING COMPANY**  
2368 University Avenue • St. Paul, Minnesota



## VITROLINER TYPE "E" FLUE!

*Attention* ARCHITECTS,  
CONTRACTORS and BUILDERS

This famous time tested Flue is now available individually—complete in a package made to fit each building or in quantity of 1 to 10,000. Underwriters listed for all Fuels, ideal for oil or gas—proven practical and successful in thousands of buildings—and used extensively in F.H.A. construction.

Also used industrially where masonry construction would be impractical.

### Features—

- ECONOMICAL IN PRICE
- PROVEN THRU 10 YEARS OF SERVICE
- LIGHT WEIGHT AND QUALITY BUILT OF VITREOUS ENAMELED STEEL
- INSTALLED IN 2 HOURS



Write today for details.  
Dept. A-1



**CONDENSATION ENGINEERING CORPORATION**  
122 South Michigan Avenue, • Chicago 3, Illinois  
MFRS. OF VITREOUS ENAMELED PIPE FOR 20 YEARS



# HEATCRAFT



The Heatcraft Oil Burner has 7 important advantages over ordinary burners, and that's why dealers everywhere are switching to the Heatcraft line. Heatcraft means faster, more profitable sales.

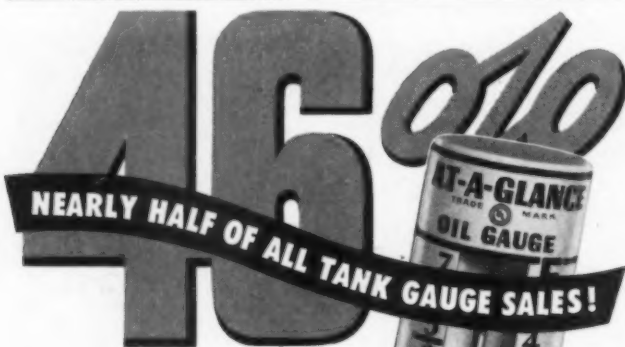
Sharp-eyed home owners are quick to recognize Heatcraft superiority and that's why public preference for Heatcraft quality is growing by leaps and bounds.

Write, wire or phone for literature and details concerning the possibility of a Heatcraft dealership in your locality. Address Dept. A, 2434 Crittenden Drive.

STOKERS • FURNACES • GAS BURNERS

**HEATCRAFT COMPANY**

2434 CRITTENDEN DRIVE, LOUISVILLE, KENTUCKY



Recent surveys show that our At-A-Glance gauges accounted for 45.9% of the total sales of all tank gauges during the last few years. Such popularity must be deserved! If you are not fully acquainted with this accurate, easy-to-read, durably-built gauge — write for illustrated literature which describes it and our new SENTRY DRAFT CONTROL in detail.



On guard 24 hours a day!



**KRUEGER SENTRY GAUGES**

GREEN BAY • WISCONSIN

## Wage Incentive Plans

(Continued from page 73)

The management which will contribute most to the success of our industrial economy is that management which will select and train the most competent individuals to gather the facts necessary to determine the best methods of operation of all members of the organization from top to bottom.

After establishment of the best possible conditions and facilities, there are two further steps with which little disagreement is to be found:

1. To determine, through engineering means, the best methods of performing the work and to make the greatest use of ideas contributed by men on the job.
2. To determine by careful analytical study the reasonable amount of time necessary to perform each operation.

Thus, the main problem of industrial engineering and industrial relations is directly in the hands of industry.

## Insulation—FHA

(Continued from page 85)

### 203. Calculations of heat loss.

Calculation of heat losses shall be based on the following—

(a) Data and methods set forth in the current edition of "Heating Ventilating Air Conditioning Guide,"

## "Made-Rite"

### DUCTS



### SMOKE PIPE



### FURNACE PIPE



### FURNACE FITTINGS

You can save yourself time and money and make certain of well-tailored installations by contacting us for your pipe and fitting needs.

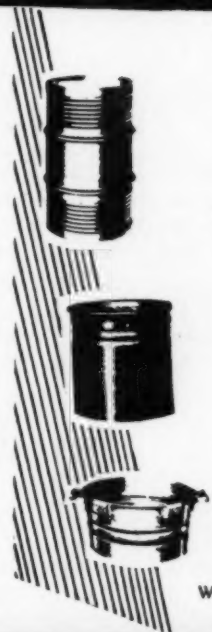
We are proud of our reputation and we want to help you fill your requirements with precision fittings . . . MADE-RITE. A postcard to us will bring you more information.



**"Made-Rite" Co., Inc.**  
10th & Monroe St. Newport, Ky.

AMERICAN ARTISAN, December, 1947

FOR THAT PERFECT  
**ROLL**  
IN SHEET METAL

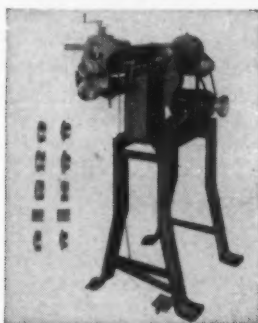


## THE MILTON *Electric*

### ROTARY MACHINE

#### Immediate Delivery

Depth of throat 13"  
Capacity 18 gauge  
4 speeds  
hand or foot operated  
Wire turning, burring, beading, crimping and  
special rolling operations.



We Specialize in New & Used Sheet Metal Working Machinery

**MILTON EQUIPMENT CO.**

404 RACE ST.

PHILADELPHIA 6, PA.

WA 2-1734

Does Every Cutting Job  
**BETTER...**  
**EASIER...**  
**QUICKER...**

No matter what type of cutting—either irregular shapes or straight splitting—from ANY width sheet, you'll quickly find that the Marshalltown Throatless Shear is the most profitable tool in the shop.

Furnished in hand operated or motorized models.



Get Special Shear Bulletin Today. Gives details of sizes from 18 gauge to one-quarter inch capacity.

**MARSHALLTOWN MFG. COMPANY**

920 E. Nevada Street, Marshalltown, Iowa

BETTER  
DELIVERY

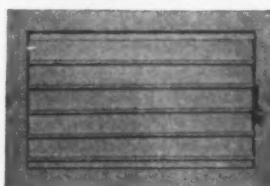
## **VICTORY REGISTER** (STYLE V)

MODERATELY  
PRICED

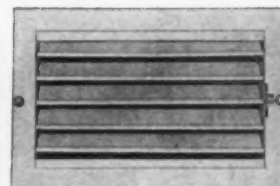
A ONE-PIECE REGISTER OF STURDY CONSTRUCTION

### PERFORMANCE

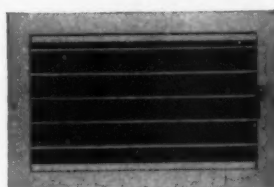
Up-Down deflection as required for "Good Practice" rating by "YARDSTICK", published by National Warm Air Heating and Air Conditioning Association.



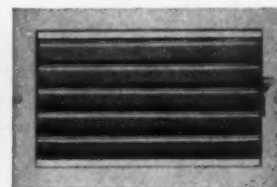
CLOSED



DOWN DEFLECTION



STRAIGHT

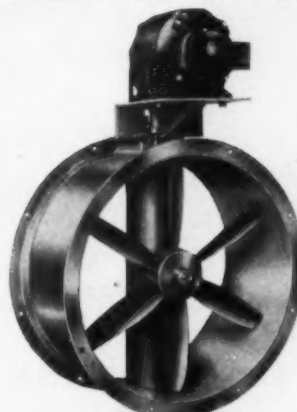


UP DEFLECTION

Write for Catalog #12 showing all types of Air Conditioning Registers and Grilles.

REGISTER & GRILLE MANUFACTURING CO., Inc.  
66 BERRY STREET  
BROOKLYN 11, N. Y.

## "DANA" DELUXE SPRAY BOOTH FANS



Immediate Delivery!

Complete Line of Sizes from 12" to 42"  
With or without Motors

The ultimate in positive elimination of fumes and vapors in paint spray booths and other hazardous locations.

Write for Descriptive Literature  
and Prices

THE DANA FAN & BLOWER CORP.  
(Formerly Geo. B. Klee Co.)

3501-27 Colerain Ave.

Cincinnati, 23, Ohio

# REPAIR PARTS

for... **STOVES • FURNACES • BOILERS**

also

**FITTINGS • REGISTERS • SUNDRIES**

and...

**FIVE GREAT LINES  
OF HEATING EQUIPMENT**

★ **ARMSTRONG!** ★ **MODERNAIRE!**

★ **LUXAIRE!** ★ **RYBOLT!**

★ **JACKSON and CHURCH**

**YOUR COMPLETE HEATING NEEDS CAN BE  
FILLED BY BUYING AT—**

**DES MOINES  
STOVE REPAIR COMPANY**

SAM C. GREEN  
FRED R. GREEN

DES MOINES, IOWA  
SINCE 1869



## THE BARNES BETTER BILT GAS FLOOR FURNACE

The BARNES BETTER BILT GAS FLOOR FURNACE is enthusiastically endorsed by many home owners and builders because of the simple, quick method of installation. It's merely a matter of cutting a hole in the floor and wall furnace-size—then presto! it goes in easily and with a minimum of fuss or fuss.

And there are other important, money saving reasons why the BARNES BETTER BILT GAS FLOOR FURNACE appeals to so many builders. There's the heavy 16 gauge heating element—the slotted Port Bunsen type burner—the 26 inch overall depth which requires no pit, no basement—the new, neatly designed non-vision grill—the fact that it meets the latest rigid requirements of A. G. A.

standards for safety, economy and efficiency—and the ten year guarantee that insures your investment.



For further information on the Barnes Better Bilt Gas Floor Furnace write today

**BARNES HEATING & VENTILATING CO.**

SALES OFFICE 330 E. FOURTH ST. LONG BEACH 2, CALIFORNIA

published by the ASHVE except as modified by Sections 204 and 205.

(b) Inside temperatures 70° F.

(c) Outside design temperatures (D in the formulae in Section 202) as recommended in the "Guide" or as dictated by established local practice.

204. Tests.

Tests shall be made to determine coefficients of heat transmission of materials or elements for which such data is not available.

205. Testing procedures.

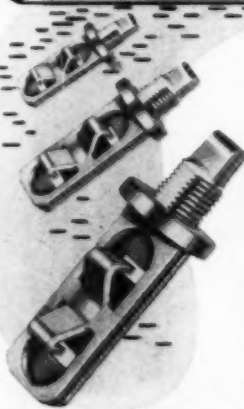
Tests for coefficients of heat transmission shall be made substantially in accordance with the procedures of the National Bureau of Standards, Washington, D. C., by either the hot plate method for homogenous materials, or by the guarded hot box method for built-up or laminated sections or elements. Certified reports by nationally recognized testing laboratories shall be acceptable.

**Neubecker—**

(Continued from page 88)

2-11 to the line 2°-11° in the side pattern as shown by similar letters and numbers. Now with 5°-6° in the half pattern for right top as radius and 5° in side pattern as center describe a short arc near 6° and intersect it by an arc struck from 10° as center with a radius pattern from 5° to 6° to 10°. With 6°-7° in the right equal to 10-6 in the true lengths. Draw lines in side

**Production is Rolling..**



**On GERETT  
"E-Z-ON"  
Damper Regulators**

● WIDESPREAD demand from furnace and heating contractors for the famous, time-saving "E-Z-ON" Damper Regulator has kept us "humping" here at Gerett to supply as many as possible, with reasonable promptness. If your supply house is temporarily

out of "E-Z-ONs", try again soon. Our deliveries are improving daily, and, if your jobber does not have them today, try again tomorrow.

**M. A. GERETT CORP.**

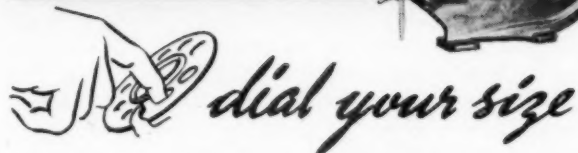
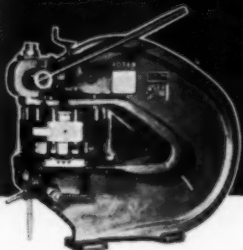
Metal Specialties Manufacturers

724 West Winnebago Street, Milwaukee 5, Wisconsin



# ROTEX

*quick change*  
**PUNCH**



That's right! Just turn the revolving turret head of ROTEX 18 to the size punch you need . . . 17 punches. 5/32" to 2", and 2" nibbling shears. Capacities, 10-12 gauge. Ready for action!

With ROTEX 18 you eliminate faulty set-up, punch-change delays, many operating accidents, extra cutting and filing operations. You turn out cleaner jobs faster, at increased profits.

ROTEX punches are lowering costs in hundreds of small shops as well as in the giant plants of Fisher Body, Lockheed Aircraft, General Electric and other nationally known firms. Why not put ROTEX on the job in your sheet metal working, too!



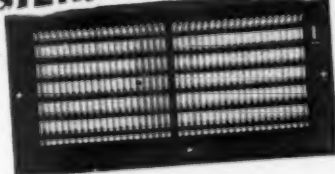
Send for DESCRIPTIVE FOLDERS

**PUNCH COMPANY**

4726 East 12th Street  
OAKLAND 1, CALIFORNIA

## EFFECTO-GRILLE

**NOW AVAILABLE!**  
*A Complete Line of*  
**AIR CONDITIONING and**  
**GRAVITY REGISTERS and GRILLES**



No. 300  
Sidewall Register  
or Supply

*the Line that has Everything!*

- EASE OF INSTALLATION
- PERFORMANCE      ● POPULAR PRICES
- BEAUTY              ● PROMPT DELIVERY

## TURNBULL

MANUFACTURING  
AND DISTRIBUTING CO.

9930 FREELAND AVE.

DETROIT 27, MICH.

AMERICAN ARTISAN, December, 1947

## YOUNGSTOWN FITTINGS FIT!

IT ISN'T mere happenstance that makes our statement correct. We plan our products, pipe and fittings for gravity and winter air conditioning, so that they "go in" with a minimum of time and change. We'll be getting more metal soon (we hope) and want you then to ask your Wholesaler about our lines.

**YOUNGSTOWN FITTINGS FIT**

**YOUNGSTOWN FURNACE COMPANY**

627 Marshall Street

Youngstown, Ohio

## WHITNEY-JENSEN PRODUCTS

30 YEARS EXPERIENCE

**No. 247 - 18"**

**POWER PRESS BRAKE**

Capacity 14 ga. mild steel  
over 7/8" 90° V-die, or 4 1/2  
tons.

47 strokes per minute.

Stroke length 1".

Die bed length 18".

Efficient for short or long  
runs on short formings.



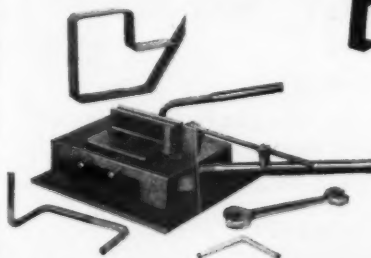
**No. 52 BENDER**  
Capacity

1/2" Rounds

1/4" x 2" Flats

1/4" x 2" x 2" Angles

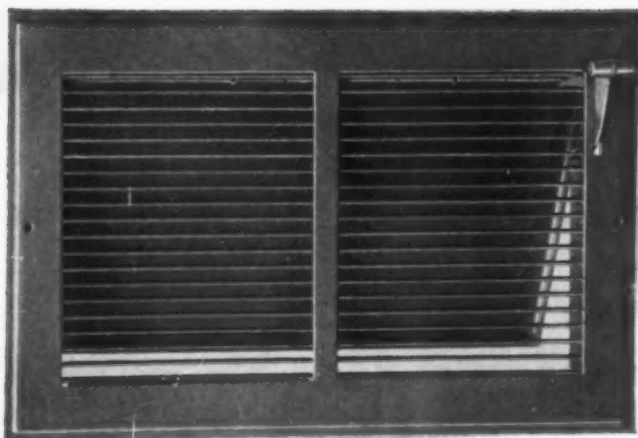
Weight—53 lbs.



## WHITNEY METAL TOOL COMPANY

91 FORBES ST.

ROCKFORD, ILL.



- |                        |                         |     |
|------------------------|-------------------------|-----|
| Sidewall Register      | - -                     | #20 |
| Sidewall C. A. Grille  | - -                     | #28 |
| Baseboard Register     | - -                     | #24 |
| Baseboard C. A. Grille | - -                     | #27 |
| Floor Faces            | Prompt Delivery - - - - | #50 |

Immediate  
Delivery  
on  
5" & 6"  
Heights

## MIDCO REGISTER CORP.

1059 Grand Ave.

St. Paul, Minn.

Factory Representatives Wanted for Some Territories.



### Speed Up Orders With a BEVERLY SHEAR

Throatless shears that cut any shape . . . straight, circular or irregular. **FASTER**—accuracy! Order No. 1 for 14 gauge. No. 2 for 10 gauge. No. 3 for 3/16 inch mild steel and 10 gauge stainless.

**BEVERLY SHEAR MFG. CO.**

3001 W. 110th Place

Chicago 43, Ill.

top pattern as radius and 6° in the side pattern as center strike a short arc near 7° and intersect it by an arc struck from 10° as center with a radius equal to 10-7 in the true lengths. Draw lines in the side pattern from 6° to 7° to 10°. With the miter line 7-8 in side elevation as radius and 7° in side pattern as center, strike a short arc near 8° and intersect it by an arc struck from 10° as center with a radius equal to 10°-8 in the true lengths. Draw lines in the side pattern from 7° to 8° to 10°. With a radius equal to 10-9 in either half plan or elevation and using 10° in the side pattern as center, strike a short arc near 9° and intersect it by an arc struck from 8° as center with a radius equal to 8°-9° in the right end pattern. Draw lines in the side pattern from 8° to 9° to 10°.

Now take a reproduction of 7-8-F-E in elevation and place it in position as shown by 7°-8°-F°-E° in side pattern. Add the collar C-D in side elevation as shown by C°-D° in side pattern. When adding the collar H-G in side elevation to the side pattern, note that the line 9° to 11° does not run in a straight line, so that the half collars at H° and G° must be drawn parallel to 11°-10° and 10°-9° respectively and a notch must be made at 10°-X, so that when the pattern is bent up, a straight line will result similar to 11-9 in side elevation. When bending the side pattern in one piece or in sections, slight bends must be made on the lines with heavy dots, to suit the inclination of the angles indicated by the shaded sections on each line. All patterns as indicated are net. Laps or edges must be allowed for either double seams, Pittsburgh lock or riveting.

**YOUR CUSTOMERS WANT**  
*Healthful Comfort*

**THERMO-DRIP**  
HEAT REGULATED  
**HUMIDIFIERS**



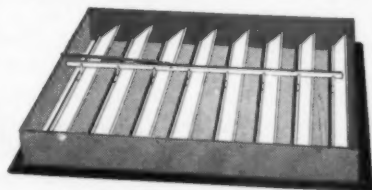
*Always Provide It!*

Thermo-Drip Humidifiers moisten air as it is heated, in direct proportion to temperature. Thermo-Drip Humidifiers regulate water feed and control the amount of evaporation. Thermo-Drip Humidifiers are manufactured from the finest materials and are designed and engineered to simplify your installation and insure complete satisfaction to your customers. Get all the facts on Thermo-Drip Humidifiers now. Install them on any type or make of furnace for correctly balanced humidification and healthful comfort. Write us today.

**Automatic HUMIDIFIER CO.**  
CEDAR FALLS . . . . . IOWA

**FOR EVERY TYPE OR MAKE OF WARM AIR FURNACE**

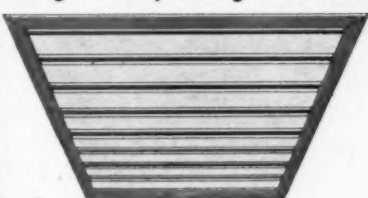
## **AIR-FLO** AUTOMATIC CEILING SHUTTER



TOP VIEW -- OPEN -- LESS MOLDING

FOR  
ATTIC  
FANS

Built so they can be installed practically flush with the ceiling, AIR-FLO Ceiling Shutters present a refined, finished appearance. Their natural aluminum color blends with any decoration, eliminating need for painting, and no grille or winter cover is required. Furnished in 5 different widths, single panel up to 73" long. No operating mechanism shows. Built-in fusible link. Meets Fire Underwriters requirements. Write for illustrated catalog 42-C of the complete AIR-FLO line.



VIEW FROM BELOW -- CLOSED  
(with moulding)

**AIR CONDITIONING PRODUCTS CO.**  
2340 W. LAFAYETTE BLVD. DETROIT 16, MICH.

## LINE UP NOW WITH **ECON-O-COL STOKERS**



... to cash-in on the huge backlog of stoker sales! You increase your profits through faster sales, make fewer service calls by selling ECON-O-COL's complete line of precision-built, highest quality stokers. And a hard-hitting promotional program backs you up every step of the way! Details of our exclusive dealer franchise, now available in several areas, await your inquiry. Write or wire us today.



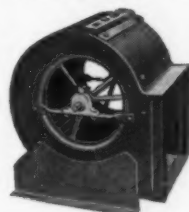
### **ECON-O-COL**

*The "Stronghearted" Stokers*

BUILT BY COTTA TRANSMISSION  
COMPANY • ROCKFORD, ILLINOIS

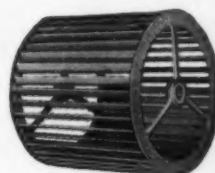
## • BLOWERS •

for  
Air Conditioning Furnace Manufacturers



The New Bishop & Babcock  
Air Conditioning  
Blower Assembly  
Type "AC"—Design 2

The New Bishop & Babcock  
Blower Wheel  
For Air Conditioning  
Furnace Blowers



The New Bishop & Babcock  
All Stamped  
Housing Assembly  
and Component Parts

Write for Bulletin No. 115

MASSACHUSETTS BLOWER DIVISION

**The BISHOP & BABCOCK Mfg. Co.**  
4901 HAMILTON AVENUE CLEVELAND 14, OHIO

## CLEAN EVERY TYPE of FURNACE



with a

### GRAND RAPIDS *deluxe* FURNACE CLEANER



Large air volume and high velocity give the Grand Rapids Furnace Cleaner maximum recovery capacity. This means faster, more efficient cleaning for every type of furnace or boiler . . . plus more jobs and larger profits for you. Standard groups of attachments available with each Furnace Cleaner are designed to reach into and clean every part of the heating plant.

Service your furnace cleaning jobs with a Grand Rapids DeLuxe Furnace Cleaner. It is sturdy, long wearing and constructed to do a thorough cleaning job under the roughest conditions. Write today for information.

**DOYLE VACUUM CLEANER CO.**

227 Stevens St., S.W.

Grand Rapids 7, Michigan



# AJAX

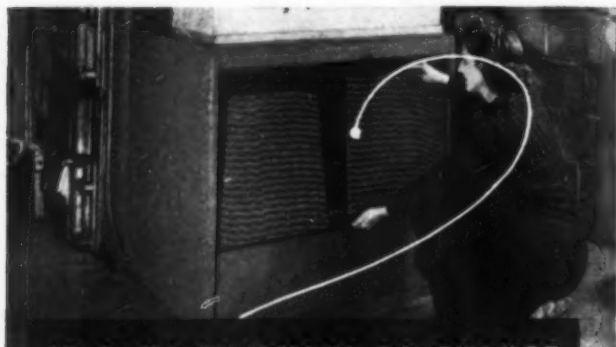
## FURNACE PIPE and FITTINGS

for Forced Air and Air Conditioning Installations

- The quality of "AJAX" Fittings is fully guaranteed.
- Scientifically designed to reduce air friction.
- Double seamed to add strength, durability and air-tight construction.
- Made of high-grade full gauge sheets. No seconds used.
- Every order, large or small, receives personal attention.
- Our engineering department is at your service and will gladly help you solve your heating problems.

### AJAX FURNACE FITTING CO.

Division of  
THE CINCINNATI SHEET METAL & ROOFING CO.  
216-20 E. FRONT ST., CINCINNATI, OHIO



**IT PAYS EVERYONE TO CHANGE  
TO DETROIT AIR FILTERS**

For your customers, Detroit Air Filters mean . . .

- Low maintenance cost
- Maximum dust-collecting efficiency
- Minimum air resistance
- Greater dust-carrying capacity
- More uniform performance
- Greater economy and long life

Sold only through the warm air heating, ventilating and refrigeration trades, Detroit Air Filters are recognized as dependable products that mean more profits for you. Write for illustrated booklet.

### DETROIT AIR FILTER COMPANY

P.O. Box 407 — Woodstock, Illinois

## Zideck

(Continued from page 106)

of the leaf-portion contacting the sheet, adjustable to only 3/16-inch width by removing the bolted-on bar or plate. Even with this bar in position, the leaf-width is less than 1/2-inch, so that steps in the sheet can be formed within the limits of between 3/16 and any other desired width. The leaf, or apron, is commonly provided with bolt holes for fastening to it of an angle bar, as shown in Fig. 3, in this Group. This angle is used when heavier gauge metal or wide sheets are worked, supporting the sheets. There are also provisions in the leaf for fastening to it of wood or metal forms over which to bend the sheet, as formerly practiced in cornice and similar ornamental sheet metal work.

The power brake is of advantage in forming heavier gauges of metal. But for light sheet metal work the hand-operated brake is faster. There is no other difference. It is obvious that if we must brake metal thicker than 1/16-inch, in lengths of possibly 8 or 10 feet, the moving of the leaf in braking the metal calls for power, and for this work the power brake is desirable. It is equally obvious that the power-actuated leaf must of necessity move slow (for safety of the operators mainly); and if we work gauges lighter than the 18-gauge, we can do thrice as much work by moving the leaf by hand. In Fig. 1, of the illustrations in Group 4, we see the standard manipulation of the sheet, inserted through the machine, with only a narrow portion of it protruding over the edge of (B) for braking. Inasmuch as the beveled portion of (B) seldom exceeds 60 degrees



## New! HEXDALL DUCT HANGERS

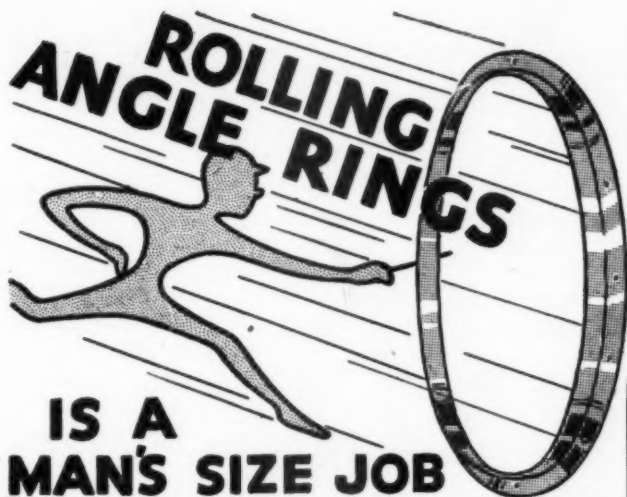
U. S. Patent No. 2264666

Hang ducts like "greased lightning" . . . make more money on each job . . . save up to 92% on labor with these sensational new cadmium-plated duct hangers. No special tools. You minimize strain on your men, reduce accidents. No lost or worn-out tools. Eliminate strip steel, nails, screws, bolts, rivets, or wire . . . handle all types of duct material, including aluminum. Get free samples and free folder—write us today, including name of your favorite jobber!

**A. M. HEXDALL CO.**  
MORRIS, ILLINOIS  
Manufacturers of Sheet Metal Specialties.

**JOBBER AND SALES AGENTS . . .** This new development is the sales sensation of the sheet metal industry. Write for information about territories available, literature, samples, and prices.

# ROLLING ANGLE RINGS



## IS A MAN'S SIZE JOB

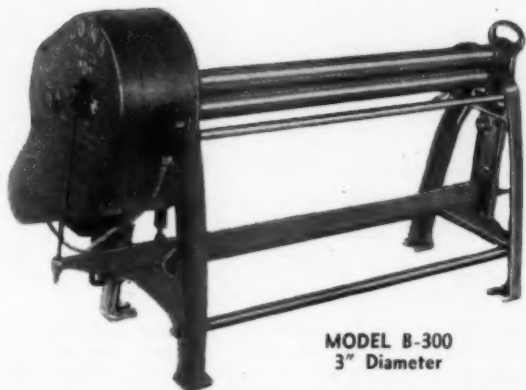
Our experienced operators know all the answers to your angle ring requirements. Rolled to your specification—accurate in dimension—uniform in curvature, guaranteed to fit the job. We consider it a man's size job to roll the type of angle ring you want for your specific job. Saves you time and effort. "FABRICATING to customers' specifications and prints" has enabled us to accumulate a large stock of punches and dies for piercing, blanking, notching and forming—available to you. Send us your fabricating requirements.

*Write for our circular illustrating the scope of our service.*

### NATIONAL METAL FABRICATORS

2136 S. Sawyer Ave. - Chicago 23, Ill.

## LOWN Slip Roll Forming Machines FIT YOUR JOB!



MODEL B-300  
3" Diameter

If you want MORE PRODUCTION and ECONOMICAL OPERATION, use LOWN Slip Roll Forming Machines.

Our machines are designed for sturdiness and ease of operation to provide peak productivity.

*Rugged — Rigid — Attractive — Prompt Deliveries.*

The LOWN Slip Roll Forming Machines are built in a range of sizes from which you can choose the exact unit for your requirements.

### San Angelo Foundry & Machine Co.

San Angelo, Texas . . . . . E. Upton & SFE Tracks  
Distributors in Most Principal Cities — Write for Bulletins.

## SOMETHING NEW



## IN BLAST GATES

MODERN IN DESIGN—  
BUILT FOR TOP EFFICIENCY  
— PRESSED STEEL  
B L A S T G A T E S

*For particulars write for Bulletin No. 35*

### Rees Blow Pipe Mfg. Co.

340 SEVENTH STREET SAN FRANCISCO 3, CALIF.

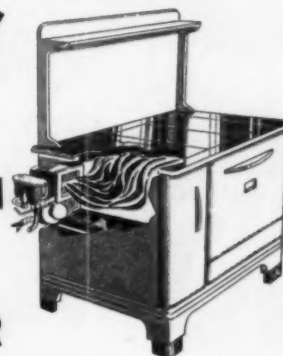
## Profits!

Through the

### SUPER-THERM

*Combination*

### OIL BURNER



SALES PROSPECTS for this modernizing, easily installed oil burner are *all* owners of wood and coal stoves and ranges. Super-Therm fits any size stove, front or rear—will last a lifetime—will not soot or smoke—has automatic safety features. Write now for details and *dealer profit facts*.

### THERM OIL BURNER CO.

*Pioneers of the Oil Burning Industry*

2105-D WESTLAKE AVE. SEATTLE 1, WASH.

# PERFORMANCE PLUS!

## ATH-A-NOR

### Furnaces and Parts



Performance is the yardstick for measuring the efficiency of any heating plant, and those that will operate year after year with little or no attention are the ones which will return you the most profit.

You're sure of top drawer performance when you install ATH-A-NOR Furnaces and parts exclusively. Over fifty years of furnace manufacturing experience guarantee you home heating plants with performance ratings and lasting qualities to satisfy the most critical clients. Investigate now . . . write for literature.

## MAY-FIEBEGER COMPANY

Manufacturers of Quality Heating Equipment  
for Over Fifty Years.

Newark

Ohio

**NOW IN PRODUCTION!**  
**PROMPT DELIVERY**

**STANDFORATED**  
PERFORATION OF ALL METALS

"BEND - EZY"

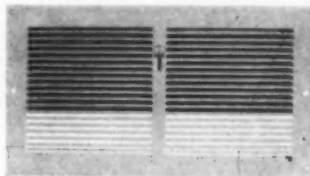
**FORCED AIR REGISTERS and GRILLES**  
FOR SIDEWALL AND BASEBOARD INSTALLATION

Immediate Shipment  
on these sizes:

8 x 6 — 10 x 6  
12 x 6 — 14 x 6

SPECIAL SIZE: Made to  
Order.

Can also supply 24 x 6 and 30 x 6  
intakes to match. Quick delivery on  
other size registers and intakes.



PERFORATED METALS FOR EVERY  
INDUSTRIAL USE

Write for Complete Information and Price List

**STANDARD**

3137 W. 49th PLACE

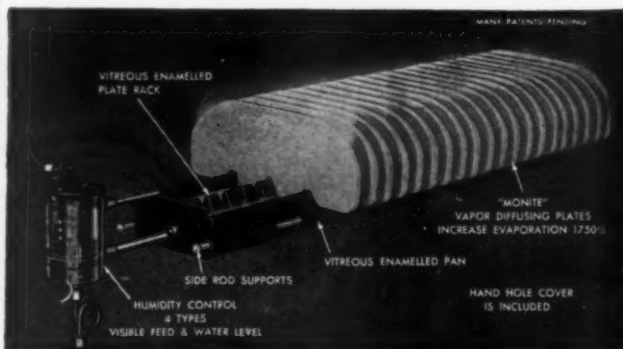
STAMPING &  
PERFORATING CO.

CHICAGO, ILLINOIS

slope, in seam-hook forming we must resort to an additional operation, squeezing down the bent metal by either clamping by (B), or leaf movement as of Fig. 3. We can brake the sheet to any degree between level and sixty degrees, but we cannot go any farther with the bend in the operation. If we want a bend past 150 degrees from level, we must do it by the aforementioned second operation. The brake is provided with a bend-degree gage, but not with a bend-distancing gage, like the bar folder is or, more so, like a squaring shear is. The newer makes of these machines might come out with this distancing gage, but the thousands of brakes in the hands of the sheet metal men are without it, compelling them to mark the sheets for forming operations.

### Machine Adjustments

The operator of the brake, be it handbrake or power brake, is familiar with the number of adjustments provided for in the machine. These adjustments have to do principally with the margin of clearance allowed between the point of (B) and the contacting edge of (C). In the braking of lighter gauges of metal the clearance is largely disregarded. But adjustments of the clearance to the metal thickness worked are in place if we want to prevent the metal cracking and, incidentally, prevent damage to the machine. In the following article dealing with Tools and their Uses in this series we shall treat with these adjustments by word and illustrations, suggesting also several ways of distance-gaging practical in these machines, as also how to make the gages.



## MONMOUTH HUMIDIFIERS

There are many humidifiers for warm air systems on the market. Some of them sell for next to nothing. But unless such an automatic device gives high efficiency and continuous dependable service—ANY amount of money is simply thrown away on it.

Experience has shown heating dealers that with a Monmouth Flotrol or a Micro-Feed, both very profitable items for you in the first place, this profit is NOT eaten up by service calls. Designed on engineering principles which are unequaled, accurately built of the finest materials, Monmouth is strictly a precision product, yet costs little more than makeshift devices. Use genuine Monmouths on your jobs—they save everybody money in the end. We also make gas-fired Humidity Conditioners for all radiator systems. Details and prices on request.

**THE CLEVELAND HUMIDIFIER CO.**

7802 Wade Park Avenue Cleveland 3, Ohio



# WHITNEY LEVER PUNCHES

No. 4B PUNCH



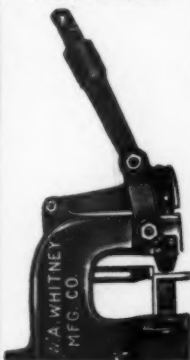
Length  $8\frac{1}{2}$  inches. Capacity  $\frac{1}{8}$ -inch through 16 gauge. Deep Throat—2 inches. Weight—3 pounds. Punches and Dies— $1/16$ " to  $9/32$ " by 64ths.

No. 6 PUNCH



Length—26 $\frac{1}{2}$  inches. Capacity —  $\frac{1}{4}$ -inch hole through  $3/16$ -inch iron; specially adapted for button punching or template work. Punches and dies  $\frac{1}{8}$ " to  $9/32$ " by 32nds.

No. 91 PUNCH



**CAPACITY**  
 $\frac{1}{8}$ -inch hole through  $\frac{1}{4}$ -inch iron;  $\frac{1}{4}$ -inch hole through  $3/16$ -inch iron; 2-inch hole through  $\frac{1}{4}$ -inch iron. Depth throat, 5 inches. Weight, 82 lbs.

*We have tools for every purpose needed by Sheet Metal Contractors.*  
*Ask your Jobber*

No. 1 PUNCH



Length—34 inches. Capacity —  $\frac{1}{8}$ -inch hole through  $\frac{1}{4}$ -inch iron. Punches and dies in sizes from  $\frac{1}{8}$  to  $9/16$  by 64ths.

No. 2 PUNCH



Length — 23 inches. Capacity —  $5/16$ -inch hole through  $\frac{1}{4}$ -inch iron. Punches and dies in sizes  $3/32$  to  $1/2$ -inch by 64ths.

CHANNEL IRON PUNCH



Companion to No. 2 Punch. Every part of the two punches interchangeable, including punches and dies. Capacity— $1/4$ -inch hole through  $\frac{1}{4}$ -inch iron.

W.A.  
W

**WHITNEY MFG. CO.**  
636 RACE ST. ROCKFORD, ILL.

## Only \$2.00 for This Outstanding Book on Air Conditioning

THIRD EDITION

### Air Conditioning for Comfort

By Samuel R. Lewis

288 Pages—6 $\frac{1}{2}$  x 9 $\frac{1}{2}$ —Cloth Bound

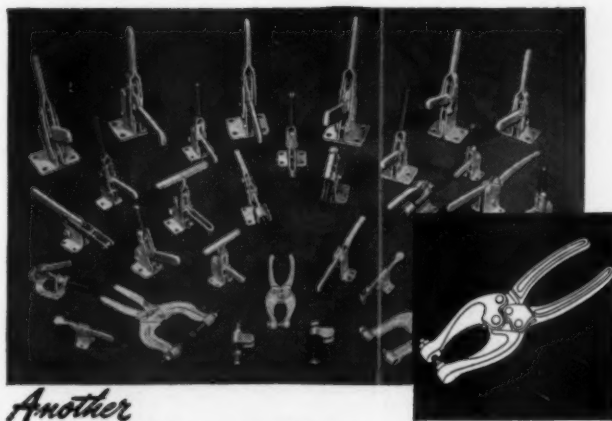
Easy to understand . . . accurate . . . comprehensive . . . these are the features of this third edition of Samuel R. Lewis' well-known AIR CONDITIONING FOR COMFORT. Fundamentals are fully and clearly covered. Correct procedure in designing complete systems for both residences and large buildings is explained step by step. In addition, considerable original data on such subjects as standards, noise control, measurements, and fire protection codes has been included.

Send \$2.00 for a copy today to the address below. We know you will consider this one of the finest air conditioning books you have yet seen, but if you should be dissatisfied with it for any reason whatever, your money will be promptly returned to you.

**KEENEY PUBLISHING COMPANY**

6 N. Michigan Avenue

Chicago 2, Ill.



*Another*

## DE-STA-CO CLAMP Designed to *Take It!*

A new addition to the versatile De-Sta-Co family of production clamping tools. No. 464 Portable Clamp designed for sheet metal work. Positive toggle lock holds parts fixed for drilling, riveting, welding. Speeds assembly of ducts, housings, cabinets, auto bodies. Ideal for template work.

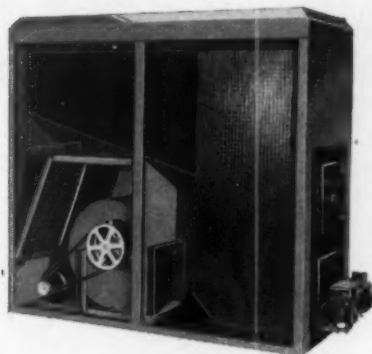
No. 464 Plier Clamp offers a firm hand grip for opening and closing. Jaws clear flanged metal edges. Adjustable for efficient pressures. Narrow nose for close spaces. Entire tool is forged and can be altered easily for special application. Replaceable hardened steel bushings minimize wear. Write for additional information on Model 464, or catalog No. 47 describing complete line.

*De-Sta-Co clamps are stocked in principal industrial centers*

**DETROIT STAMPING COMPANY**

341 Midland Ave.

Detroit 3, Mich.



**THE VAPOR-OIL FURNACE**—5 models ranging from 80,000—174,000 BTU

**CONSTRUCTED AND DESIGNED** to give heat economically for years with minimum of repair and service.

**EASILY CONVERTED** from oil to gas—or—in case of fuel emergency—the burner can be removed in 10 minutes by the home owner and wood or coal be burned as in a fireplace.

**AUTOMATIC FURNACE COMPANY**  
1111 Race Street      Lansing 5, Michigan

**VAPOR-OIL**  
CLEAN - AUTOMATIC - ECONOMICAL

## BUY THE BEST . . . BUY A REED ALL STEEL BENDING ROLL



Here, for both production and job shops  
is the answer to light gauge rolling jobs.  
Made in five sizes, from 36" x 10 ga.  
to 72" x 16 ga.

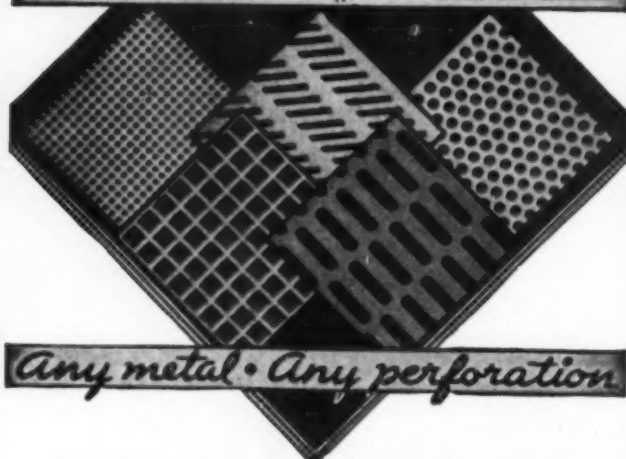
★ ALL STEEL  
★ COMPACT  
★ BRONZE BEARINGS  
★ ENCLOSED GEARINGS  
★ LOW IN COST

Available for prompt delivery, and we do mean **PROMPT**

### REED ENGINEERING COMPANY

ENGINEERS AND MANUFACTURERS  
CARTHAGE, MISSOURI, U. S. A.

## PERFORATED METALS



H. & K. Perforated Metals are accurately made and embrace a great variety of perforations for use in screening, grading, ventilating and straining of different substances.

Tell us your requirements and we will send booklet showing actual sizes of perforation.

## The Harrington & King PERFORATING CO.

5649 Fillmore St., Chicago - 114 Liberty St., N. Y.

## White

(Continued from page 111)

accomplished along these lines since last winter but I expect that we will experience shortages this winter, nevertheless.

As for fuel potential, it has been estimated that there are, from present sources, some 14,400,000,000 gallons per year available or about ten times the sales of last year. Some of this will be added to production by present expansion programs. The potential itself is expected to be increased by the application of new refining processes and the discovery of new fields.

Our view, then, is that the imbalance which exists is temporary; that production can keep up with expansion when materials are adequate and that the fuel potential is sufficient for our markets but it is recognized that some of our demands will have to compete with others for the product.

### Price Comparisons

In 1926 propane in tank car lots averaged about 11c per gallon f.o.b. group 3. By the end of 1941, the prices had declined to 2½c at which level they were frozen by OPA.

Quotations, as currently published, are running, in tank car lots, f.o.b. the refinery, for propane from 4.7 to 6.5c per gallon, butane from 5 to 6.5c per gallon.

Butane will generally command a higher price, particularly in cold weather, for it has an octane rating of nearly 100 and is in demand for blending into motor fuel to increase volatility. It is, therefore, worth the

## Vernois REPAIR PARTS

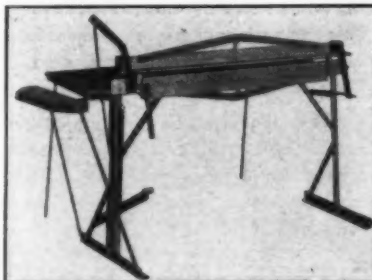
Vernois furnaces are heating many homes throughout the country. They are like anything else in that they'll need repairs once in a while and when they do be sure you make them with genuine Vernois repair parts. It's better in the long run.

MT. VERNON FURNACE & MFG. CO.

MT. VERNON, ILLINOIS

## HARRIS BRAKES

Portable - Sturdy  
All-Purpose  
Brakes



The 4' Brake weighs 175 lbs. Can be ready to transport by removing 4-¾ nuts in 5 minutes. Folds into a bundle 5" x 11" x 6". Easily handles 26 ga. iron. Has Slip Off Feature. 2-Tool Benches. Indispensable if you work on the job.  
THE ROBBIE 1 ft. BRAKE Handles 26 ga., is for Small Fast Jobs as Boxes — Outlets, etc., where production and ease of operations are important.

A. R. HARRIS

4548 Hohman Ave., Hammond, Indiana  
Phone Sheffield 3023

**Sundstrand** OIL BURNERS

FOR  
• CLEAN  
• QUIET  
• ECONOMICAL  
• AUTOMATIC HEAT

**POPULAR WITH DEALERS FOR OVER 26 YEARS**

WRITE US FOR COMPLETE INFORMATION

**SUNDSTRAND ENGINEERING CO.**  
ROCKFORD, ILLINOIS

**Schild**  
ALL-PURPOSE  
METAL CUTTER



Get this new labor saving tool for "on-the-job" or shop work. Easily cuts metal, heavy as 16 ga. Changeable blade of tough tool steel. Handle forged of rugged spring steel. Designed and built for abuse. At your Jobber Dealer or send check or money order for immediate prepaid shipment.

Complete Tool \$5.00      Extra Blade 75c

**Schild MANUFACTURING COMPANY**  
739 Broadway      Milwaukee 2, Wis.


**REPAIRS FOR ANY FURNACE BOILER OR STOVE**

**REPAIR PARTS FOR ANY FURNACE, BOILER OR STOVE**

Complete Line of Sundries and Supplies

IMMEDIATE DELIVERY!

**OMAHA STOVE REPAIR WORKS**  
1206-8 DOUGLAS ST., OMAHA 2, NEB.  
SINCE 1882



**TINIT**  
makes tough jobs easy!

**To Solder...Tin with TINIT**

Tinit cleans and tins tough repair jobs or new surfaces in one easy operation—frees your time for profitable work—penetrates rust, dirt and grease. Used successfully for 18 years. Sold by automotive, refrigeration service, tinning supply and other jobbers.

**TINIT MFG. CO., Inc. • P.O. Box 794 • Denver, Colo.**

**ILLBRONZE** ←

BRAND  
EXCLUSIVE PRODUCERS  
Of The Famous  
NO. 65 S AND NO. 42  
CHROME FINISH PAINTS  
#800 HI-HEAT ALUMINUM PAINT  
R. M. GOLDEN LUSTRE GOLD PAINT

Industrial & Automotive Finishes  
Lacquer Thinners • Bronzing Vehicles  
Manufactured by

**ILLINOIS BRONZE POWDER CO. INC.**

Dept. AA, 2015-29 S. Clark St., Chicago 16

ALL SHADES of BRONZE POWDERS MADE TO ORDER!

**ORNAMENTS**



**STAMPINGS & SPINNINGS**

Zinc Ornaments Available From Stock. Copper, brass, bronze, aluminum and stainless steel ornaments made up promptly.

If you don't have catalog K, send for it NOW.

**MILLER & DOING**  
65 YORK STREET      BROOKLYN, N. Y.

**The GOESE TIME SAVER DAMPER CONTROL**



Order a gross today through your jobber of these superior quality damper controls used on either square or round pipe. It will enable you to turn out jobs easier and faster.

**GOESE MFG. CO.**  
2548 N. Eighteenth St.  
Milwaukee 6, Wisconsin

*You get more with* **Gilcoz**

OIL BURNING  
WATER HEATERS  
FLOOR FURNACES  
AIR CONDITIONING FURNACES

**DESIGNED TO Sell...PROFITABLY**

**GILCOR PRODUCTS CORPORATION**  
DOWAGIOCH, MICHIGAN



Heating  
Sheet Metal



Air Conditioning  
Supplies

Furnace pipe, adjustable  
elbows and Fittings

ALSO: Complete line sheet metal hand tools

**Frank X Enderle, Inc., Ltd.**

1600-1700 San Fernando Road, Los Angeles 41, Cal.

## Chicago Steel Bending Brake



STANDARD HAND BRAKE  
ONE MAN OPERATION

**DREIS & KRUMP MANUFACTURING CO.**  
7404 LOOMIS BLVD. CHICAGO 36, ILL.

AUTHORIZED

## OIL BURNER FUEL UNIT REBUILDERS

- Keep your replacement oil burner fuel units in top condition for better service and profits.
- AUTHORIZED parts and rebuilding service for all popular makes.
- Our factory trained mechanics assure prompt, accurate and dependable service.
- Complete stock GENUINE factory parts, special rebuilding tools and testing equipment.
- Quick, reliable service on all orders within a 200-mile radius.

PARTS AND CONTROLS FOR AUTOMATIC FUEL BURNING EQUIPMENT

**Crescent Parts & Equipment Co., Inc.**

825-831 South Boyle Ave.

St. Louis 10, Mo.

## PROBLEMS IN ROLL FORMING SOLVED



TIMKEN  
Bearings Used  
Throughout

QUICKLY AND  
ECONOMICALLY

Consult DAHLSTROM

Fifteen years' experience guarantee you the cooperation and solutions you need to solve intricate roll forming problems. Send us a sample or sketch for a quotation. Remember that Dahlstrom Roll Forming machines enable you to produce finer work with a minimum of time and expense.

**DAHLSTROM  
MACHINE WORKS**

4972 No. Elston Ave.  
Chicago 30, Ill.

price of motor fuel to the refiner and motor fuel absorbs more than twice the volume of butane and propane used by the industry.

Chemical requirements also compete with domestic and industrial uses. Synthetic rubber took 268,946,000 gallons of butane in 1946, a 48% increase over 1945 and 60% of all butane sold. Chemicals alone took 185,284,000 gallons, an increase of 75%, and new uses are being found daily.

Agricultural uses are also increasing. Straight butane is in ever-greater demand for motor truck operation. Recently, the first officially observed airplane flight was made on butane which the experimenter said cost him 9c per gallon as against "about 37c for aviation gasoline."

City gas utilities are also large consumers. Their



## "CRARYS" RAIN WATER CUT OFFS

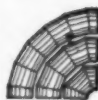
Made in all Standard  
Conductor Pipe Sizes.  
Plain Round and Cor-  
rugated Round.

Write for Prices and  
Name of your nearest  
Jobber.

**GALVAN MANUFACTURING CO.**  
New Albany, Indiana



## Full Size Blueprint Patterns



90°



90°



45°



30°

COLLECTOR PATTERNS, 6" to 20" dia. of intakes  
ELBOW PATTERNS, in 2 sets—2 to 9 piece & charts  
45 & 30 DEG. BRANCH PATTERNS 2" to 24" on 3" to 48" trunk line  
PUTTY BAR hip, gable & single pitch skylight patterns with chart  
PUTTYLESS BAR, hip, gable & single pitch skylight patterns with chart  
STATIONARY VENTILATORS 4" to 36" in 2 sets  
REVOLVING VENTILATORS 6" to 30" in 2 sets  
SHIP VENTILATORS 4" to 48" dia. of base

Write for pattern circular and prices covering all blueprint patterns

**G. L. GRAY, P. O. Box 520, New Haven 3, Conn.**

Mention American Artisan

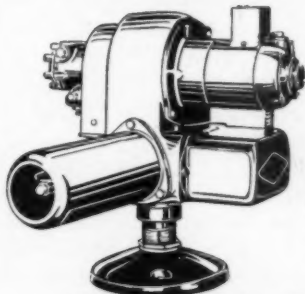
COMING NEXT MONTH

THE

**JANUARY DIRECTORY  
AND SHOW NUMBER**

Watch For It!

## Howell *Controlled flame* burners



are proving highly satisfactory as replacements. Home owners like the sturdy construction. Precision built through-out for long life and perfect alignment of moving parts. Large draft tube and ample fan capacity eliminate unnecessary flame noise. Easy to control air shutter for a clean efficient flame.

A quality oil burner, you will be proud to sell.

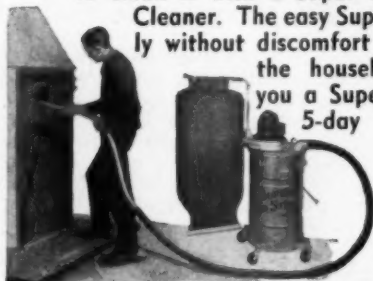
Parts mounting dimensions are standard, permitting interchange of parts for servicing.

Manufacturer distributor and dealer inquiries invited.

**H. A. HOWELL OIL BURNER CO., Dixon, Ill.**

## Clean 'em HOT or Clean 'em COLD

- There is no need to wait until the furnace cools to clean it with a Super Red Streak Furnace Cleaner. The easy Super way cleans quickly without discomfort or dirt to those in the household. Let us send you a Super Red Streak for a 5-day free trial. Write.



**NATIONAL  
SUPER SERVICE  
COMPANY, INC.**

1944 N. 13th St.  
Toledo 2, Ohio

National Super Service Co. of Canada, Toronto, Ont., Vancouver, B. C.



Std. Arr. No. 1  
for Belt Drive

New and Improved "EX" Fans are now available in standard sizes from No. 15 to No. 80 and from 200 to 30,000 CFM Capacity with pressures up to 15" W.G. These fans are commonly used for exhaust problems to handle dust, fumes, shavings, etc., but can be adapted for forced draft service.

"EX" Fans are furnished in all standard arrangements of the N.A.F.M. The design is such that it can be easily modified to suit special assemblies, thus "EX" Fans are ideal for resale purposes, as part of factory assembled units.

Write us about your problems. Send for Bulletin No. EX-41

**BAYLEY BLOWER COMPANY**

1817 South 66th Street

Milwaukee, Wis.

## WARD MACHINERY COMPANY

*Specialists*

Machines — Tools  
for

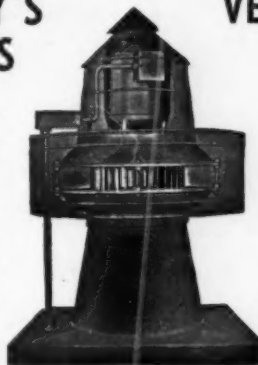
Fabricating Sheet Metals

564 W. Washington Blvd.

CHICAGO 6, ILLINOIS

## INDUSTRY'S PROBLEMS

No belts to slip. Direct connected. Sets up on the roof out of the way of everything. A



## VENTILATING SOLVED!

compact, self-contained unit easily and cheaply installed. Write for details now, Dept. 9.

**THE GALLAHER CO.**

Owatonna, Minn.

## Remove Soot and Carbon With



This ALL PURPOSE Soot Remover remarkably cleans ALL pressure, rotary & vaporizing oil burners.

Approved by oil burner manufacturers and testing laboratories. Developed especially for the vaporizing pot type burner units. Will not clog holes, leave a residue, or overheat vital parts.

SEE YOUR JOBBER OR WRITE US.

**CLEAN SWEEP CO.** P. O. BOX 156  
S. LANSING 9, MICH.

LOOK FOR THE BROOM ON THE PACKAGE

*Available  
Now!*

**CHENEY FLASHING**  
16 OZ. 3 WAY BOND  
COPPER

**CHENEY FLASHING  
REGLET**  
16 OZ. COPPER

SEE  
YOUR  
JOBBER  
OR  
WRITE US—

**CHENEY INDUSTRIES, Trenton, N. J.**

## BRAUER has

REPAIR PARTS for all FURNACES  
BOILERS, STOVES • *Guaranteed to FIT*

**A. G. BRAUER Supply Co.**

2100 Washington Ave.

St. Louis, Mo.

**SPOT WELD**  
WITH  
**ACME "Hot Spot" WELDERS**

- Proven utility for years in thousands of sheet metal fabricating plants throughout the world.
- Write for literature and prices Complete range of sizes

Lifetime Guarantee



**ACME ELECTRIC WELDER CO.**  
2678 FRUITLAND ROAD LOS ANGELES 11, CALIF.

**IMPROVED!**




**• B B •**  
**No. 12 SHANK**  
**33 1/3% STRONGER**

IMPROVEMENT IS APPLIED TO  
No. 15—SQUARE, No. 12—1/4  
PITCH, AND No. 25—1/4 PITCH.

SOLD THRU LEADING  
JOBBER'S EVERYWHERE

**BERGER BROS. CO.**  
Main Office & Factory  
229-237 Arch St., Philadelphia, Pa.



**ADAMS FIRING TOOLS**

CLINKER TONGS  
ASH REMOVERS  
FURNACE POKERS  
FIRE RAKES  
FIRING HOES

Buy Adams Known Quality

**THE ADAMS COMPANY**  
BRIDGE STREET DUBUQUE, IOWA

**SODER STAINLESS  
STEEL RAPIDLY  
SAMPLES FREE**



**FLUXES**  
SODERING  
BRAZING & WELDING

**ALLEN**

L. B. ALLEN CO. INC. Chicago 31, Ill.  
6702 BRYN MAWR AVENUE, CHICAGO 31, ILL.

use of butane for peak-shaving and enrichment totaled 25,682,000 gallons in 1946, an increase of 64% and of propane 41,199,000, an increase of nearly 100%.

In the overall picture, domestic deliveries of LP-Gas sold for fuel, chemical raw materials and synthetic rubber components increased from 1,276,766,000 gallons in 1945 to 1,705,282,000 in 1946, a gain of 34% as against a 20% gain the year before. Exports rose from 26,059,000 gallons to 49,091,000, an increase of 88%.

The untouched markets in industry, in city enrichment, town plant distribution, in small town and rural communities, the farm, the ranch and in the hundreds of trailer homes in camp and on the highway, give us a prospect which is limited only by the availability of materials, the energy of our worthy competitors, and our ability to promote satisfactory consumer relations.

**"CORRECT PRACTICE  
IN INDUSTRIAL SHEET METAL WORK"**  
**200 Pages—8 1/2"x11"—\$1.50**

Contains all basic design and engineering data necessary for the proper planning and installation of fume removal, dust collecting, wood-waste removal, ventilating and other industrial sheet metal systems and equipment. Made up in the main of data published in the Sheet Metal Section of "American Artisan," this book offers dozens of practical designing ideas, layouts, installation kinks, tables and charts, contributed from their experience by many of the country's leading industrial sheet metal experts.

**KEENEY PUBLISHING COMPANY**  
6 North Michigan Avenue Chicago 2, Illinois

*Now Available . . .*

A complete reprint, under one cover, of Professor S. Konzo's invaluable series of articles —

**The "HOW, WHAT AND WHY"**  
*of the new*

**WINTER AIR CONDITIONING MANUAL**

Everyone who is now using or expects to use the new "Code and Manual for the Design and Installation of Warm Air Winter Air Conditioning Systems" will find Professor Konzo's series a source of much practical help in understanding the Code and correctly applying it to actual jobs. In this great series, Professor Konzo not only explains step by step exactly how to use the Code, but, in addition, tells in detail of the research and experience that is behind each step in the suggested procedures.

**Price—Only \$1.00 per copy**

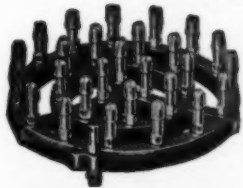
**AMERICAN ARTISAN**

6 NORTH MICHIGAN AVE. CHICAGO 2, ILLINOIS



# BARBER BURNERS

For All Gas Appliances



We have the facilities and experience for designing and building the exact type and size of burner unit to fit any gas appliance, using natural, manufactured, Butane or bottled gas. We cooperate with any reliable manufacturer in the necessary development and laboratory testing, and in acting as continuous source of supply for his burner units.

Latest Catalog on request



THE BARBER GAS BURNER CO.  
3704 Superior Ave., Cleveland, Ohio

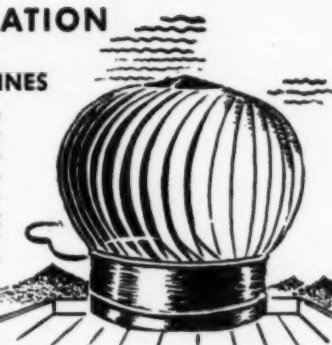
## TURBINE VENTILATION

with a 2 mph Zephyr  
WESTERN ROTARY TURBINES

IT takes but a 2 mph breeze to operate a Western Rotary Turbine Ventilator. No power. No lubrication. No attention. Smooth functioning ball bearings assure long lasting quiet operation day and night. Bearings guaranteed for a lifetime.

Write Today for Booklet

JOBBER'S WRITE



Western

ENGINEERING & MANUFACTURING CO.

1728 E WASHINGTON BLVD  
LOS ANGELES 21, CALIF

510 NO DEARBORN ST  
CHICAGO 10, ILL

## CLASSIFIED

### SITUATIONS OPEN

Roofing and Sheet Metal concern, established over 70 years offers steady job and good wages in Nebraska city of 25 thousand population to working foreman, familiar with layout and fabrication. General sheet metal work ducts, furnaces, air conditioning, skylights, etc. In reply state age, etc., full information in first letter. Address Key No. 683, American Artisan, 6 N. Michigan Ave., Chicago 2.

WANTED—Journeyman Sheet Metal worker to take charge of heating department. Experienced in lay-out and installation work. Location Chicago. Good opportunity. Address Key No. 686, American Artisan, 6 N. Michigan Ave., Chicago 2.

### WANTED

#### HEATING SALESMAN

with heating experience to represent a manufacturer of nationally known automatic oil burning furnaces and water heaters. This company has a well established reputation among the trade and seeks the services of a high caliber man. Your letter should contain full details as to previous experience and salary. All replies will be held strictly confidential.

Box No. 687, American Artisan, 6 N. Michigan Ave., Chicago, 2.

### SITUATIONS WANTED

EXECUTIVE SALES ENGINEER—10 years experience in heating and air conditioning. Direct and sales promotional experience. Executive experience. Office and field engineering background. Licensed professional engineer. Prefer connection with manufacturer for E. of Mississippi. Address Key No. 685, American Artisan, 6 N. Michigan Ave., Chicago 2.

USE THE  
CLASSIFIED  
SECTION—  
IT PAYS

**Classified Section:** Rates for classified advertising are 8 cents for each word, including heading and address. One inch \$4.00. Count seven words for keyed address. Minimum \$2.00 for each insertion. Cash must accompany order.

### FOR SALE

Vaporizing, forced draft range and furnace oil burners. Floor, dual wall, basement and utility room furnaces. Highest quality; prices right, good delivery. Since 1928, The Beyer Oil Burner Co., Rosamond, California. Dealers wanted.

ALUMINUM - FUEL TANKS - STEEL.  
The tank you have been waiting for. 250 Gal. capacity 41x25 1/2 x 58—will go through 30 inch basement door—Flat on bottom and oval top—Wanted Jobber—Manufacturer Agents. Address Dixie Marine & Machine Works, Phone 2090, Florence, Ala. W. L. Young, Sales Mgr.

### FOR SALE

The chance of a life time!

On doctor's advice I am offering for sale the best equipped Air Conditioning, Heating, Commercial Refrigeration and Sheet Metal shop within a radius of 50 miles. Located in a fast growing city of 55,000 population in Southern California.

At present time gross business \$200,000 per year. Can be increased several times that by right party.

Established 30 years. Located in one of the most modern buildings in town. Must be seen to realize what outstanding opportunity and bargain this is.

For further information write:

L. F. Zickerman  
1241 East Ho't Avenue  
Pomona, California.

### WANTED

WANTED—Shearings any amount—all sizes. Galvanized, cold and hot rolled aluminum. Stainless and copper 6" minimum width to 36" minimum length, uniform quantities. Gauges from 16 to 30 inclusive.

Write or wire

Los Angeles Sheet Metal Mfg. Co.  
901-903 East 9th Street  
Los Angeles 21, Calif.  
Trinity 4713

### AGENTS WANTED

Salesmen calling Furnace Installers can add to their income by selling the Control that positively "licks" cold 70° and related complaints on forced air installations. Want coverage in central and eastern New York and central Pennsylvania. Address Key No. 684, American Artisan, 6 N. Michigan Ave., Chicago 2.

## Service Section

See Rates on Page 170

## — THOR — GOVERNMENT CLIP DIES SKYLIGHT DIES

Hand Operated

All types of dies for sheet metal production made by skilled die makers.

Write for Information

Thor Tool & Die Company

3444 Morrison Ave.  
Oakland 2

Calif.

## CARPENTERS AND BUILDERS GUIDES



INSIDE TRADE INFORMATION for Carpenters, Builders, Joiners, Building Mechanics and all Woodworkers. These Guides give you the short-cut instructions that you want—incorporating new methods, ideas, solutions, plans, systems and money-saving suggestions. An easy progressive course for the apprentice and student. A practical daily helper and Quick Reference for the master worker. Carpenters everywhere are using these Guides as a Helping Hand to Easier Work, Better Work and Better Pay.

INSIDE TRADE INFORMATION ON: 4 VOLS. \$6..

How to use the steel square—How to file and set squares—How to build furniture—How to use a mitre box—How to use the chalk line—How to use rules and scales—How to make joints—Carpenters arithmetic—Solving measurement problems—Estimating strength of timbers—How to set girders and sills—How to frame houses and roofs—How to estimate costs—How to build houses, barns, garages, bungalows, etc.—How to read and draw plans—Drawing up specifications—How to excavate—How to use settings 12, 16 and 17 on the steel square—How to build bolts and scaffolds—skylights—How to build stairs—How to put on interior trim—How to hang doors—How to lath—lay floors—How to paint and insulate

To get this assistance for yourself simply fill in and mail the FREE COUPON below.

AUDEL Publishers, 49 West 23rd ST., New York 10, N.Y.  
Mail Audel's Carpenters and Builders Guides, 4 vols., on 7 days free trial. If O.K. I will remit \$1 in 7 days and \$1 monthly until \$6 is paid. Otherwise I will return them. No obligation unless I am satisfied.

Name \_\_\_\_\_  
Address \_\_\_\_\_  
Occupation \_\_\_\_\_  
Employed by \_\_\_\_\_

AA

## SERVICE SECTION

Copy for insertion in this section must be received by the twenty-fifth of month preceding issue. One-inch minimum space accepted.

**Back  
YOUR  
FUTURE**



*With U.S.*  
**SAVINGS BONDS**

| SPECIAL                                                                                                                                                      | SPECIAL | SPECIAL |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|---------|
| <b>WEBSTER Two Stage Pumps with High Compression Fittings and pressure gauge... \$21.87</b>                                                                  |         |         |
| <b>1 HORSE POWER VACUUM CLEANER—Heavy duty—Compact and Easy to Handle complete with 11 attachments... \$15.00</b>                                            |         |         |
| <b>OIL BURNERS—Precision Built—Fully Guaranteed with 3 M-H controls... \$7.50</b><br>(Available with 18" Blower Tube extra \$5.00)                           |         |         |
| <b>500 Ft. Steam—or 800 Ft. Hot Water Heating Boilers complete with combustion chamber, 180 Gallon Tankless and steel deluxe extended jacket... \$169.80</b> |         |         |
| <b>HOT WATER CIRCULATORS—All Sizes... \$1.00</b>                                                                                                             |         |         |
| <b>AGA Approved Gas Burners complete with controls... \$9.09</b>                                                                                             |         |         |
| <b>OIL BURNER NOZZLES—Accurate—Stainless Steel with Strainer... .85</b>                                                                                      |         |         |
| <b>275 Gallon Tank Gauges—Reading in Gallons—Lots of 24—1.50</b>                                                                                             |         |         |
| <b>REQUEST PRICES ON YOUR CONTROLS AND HEATING EQUIPMENT REQUIREMENTS—WE HAVE A LARGE STOCK!</b>                                                             |         |         |
| <b>HASKO UTILITIES COMPANY</b><br>879 Tenth Avenue - New York City, 19                                                                                       |         |         |

**METAL ELBOWS**  
Galvanized - Black - Tin and Wilder - Adjustable Elbows Machine Riveted.  
Quick Deliveries



**Juniper Elbow Co., Inc.**  
72-15 Metropolitan Ave.  
Middle Village, L. I., N. Y.

*Now* AVAILABLE  
FOR IMMEDIATE SHIPMENT

# ERAYDO

COPPER ALLOYED ZINC

ROLL VALLEY  
FLAT SHEETS  
CONDUCTOR  
GUTTER  
CONDUCTOR ELBOWS  
ROOF EDGINGS  
SHINGLE STARTERS  
ASBESTOS SIDING TRIM

"The quality product in the middle price class."

**POTTS-FARRINGTON CO.**

FORMERLY W. F. POTTS, JONS & CO., INC.

1224 CHERRY ST., PHILADELPHIA 7, PA.

PHONE: Rittenhouse 6-1525

## Easload TRUCK FOR APPLIANCES

48<sup>50</sup> f. o. b.  
Los Angeles



ELEVEN built-in features of the Easload Appliance Truck guarantee easy rolling—long life—appliance protection.

For instance, the entire weight of the load rests on the wheels, which slide back to carry the load at the touch of the foot pedal. Curved tubular handles make it easy to slide the load up and down stairs, into and out of the delivery truck. The furnace or air conditioning unit is cinched onto the truck by a double ratchet. Rubber covered cross bars, uprights and wheel nuts give protection.

Write today for literature.

**COLSON**  
EQUIPMENT &  
SUPPLY CO.

1317 WILLOW ST. LOS ANGELES 13, CAL.

## WHY HANG GUTTERS THE HARD WAY?

Use the new model Saf-Way Adjustable Ladder Brackets.

Also manufacturers of Do-Mor Keyhole Saw Handles, Gutter Clamps, Fold-away Extension Benches, Hand Trucks, Hand Pipe Crimpers, Trammel Points.

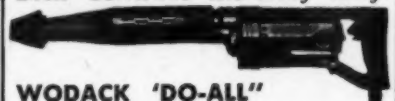


Send For Catalogue

**PIONEER TOOL CO.**

1103 Wisconsin Ave., Racine, Wisconsin

## Drill Concrete the Easy Way

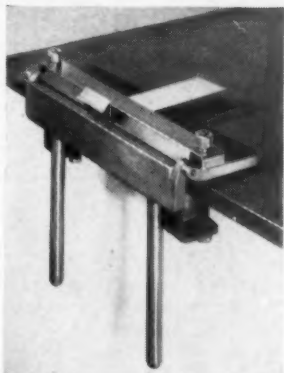


**WODACK 'DO-ALL'**  
ELECTRIC HAMMER AND DRILL

Saves time and money installing expansion anchors. Drills concrete to 1 3/4" dia.; metal to 3/4". Two tools in one. Easy to maintain. Universal motor. Star drills in 17 diameters. Also chisels, bull points, etc. Write for bulletin No. 644.

**Wodack Electric Tool Corporation**  
4627 W. Huron St. Chicago 44, Ill.  
Telephone AUStin 9866

## 10" Portable METAL BRAKE



Maximum capacity 22 gauge, 10" wide. Well balanced, easily operated, sturdy construction. Literature on other styles, capacities and sizes up to 30" available upon request.  
Dealers invited.  
Immediate Delivery While Supply Lasts

only  
**\$1000**

F.O.B.  
Detroit

No CODs

**G & S MACHINE SHOP**  
8700 Grinnell Detroit 13, Mich.

### D. D. ADJUSTABLE HOLE CUTTERS (PATENTED)

Cuts any size hole  $\frac{3}{4}$ " to 12" in any metal or material. Ask for descriptive folder A.A.

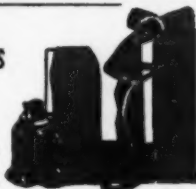
N. J. FRAYN CO.  
REDWOOD CITY, CALIF.



## AMERICAN ARTISAN Service Section

### GRAND RAPIDS FURNACE CLEANERS

Write for Details  
DOYLE VACUUM  
CLEANER CO.  
227 Stevens St., S.W.  
Grand Rapids 7, Mich



### SMITH'S CLEAT BENDERS

THE COMPLETE DRIVE CLEATING MACHINE

SAVES MORE TIME per joint of pipe, over ordinary hand methods, than any other machine used on square pipe work . . . and it is **USABLE MORE OFTEN**



per job, because it edges the pipe and makes drive cleats to join them together.

NOW TWO SIZES

NO. 12

Takes All Sizes Up to 12"

NO. 18

Takes All Sizes Up to 18"

Write for More Information.

**R. E. SMITH** 1513 MONROE,  
WAUKEGAN, ILL.

### SHEET METAL MACHINERY

Immediate Shipment

Subject to Prior Sale

CHICAGO BENDING BRAKES  
ADJUSTABLE BAR FOLDERS  
SQUARING SHEARS—CIRCLE SHEARS  
SLIP ROLLS—ROTARY MACHINES  
PITTSBURGH LOCK MACHINES  
SPOT WELDERS—ARC WELDERS  
POWER PRESSES—FOOT PRESSES  
FLOOR, BENCH & PORTABLE DRILLS

Many Other Items

Write for stock list and prices and specify machines required

**B. D. BROOKS CO., Inc.**

Tel. HANcock 5226

351 ATLANTIC AVE. BOSTON 18, MASS.  
—M11

# TO SELL OR FIND IT

USE THESE PAGES  
FOR QUICK RESULTS

## ONE STOP! ALL THE HARD TO FIND TOOLS

**NEW NO. 1 SAVAGE NIBBLERS**  
Reg. Price \$1,189. Our Price **\$895.00**  
Roller die type; 3/4" thr., 1/4" cap.

### LIBERT HIGH SPEED SHEARS:

12 ga., 36" thr., and 10 Ga. 36" thr.

### O.B.I. PRESSES

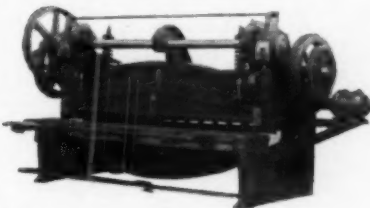
NO. 8 BLISS, Grd., 4" str., M.D.  
NO. 4 CONSOLIDATED, 3" str.  
NOS. 4 1/2, 4A, 2AA, and 2A, R. & K.  
NO. 20 BLISS; NO. 3 TOLEDO

### HORN PRESSES

GA-127 PEXTO, 2" str., 12 1/2 x 18" Bed  
NO. 25 STOLL, 6" Str., 4 1/2" Hole  
43-B TOLEDO, 2" Str., 38" Shut Ht.  
NO. 4C and 4H, R&K, Grd.  
NO. 3C R&K (5)  
NO. 12 TOLEDO, 1 1/2" Str., 2 1/4" Shaft  
NO. 41 TOLEDO, 1 1/2" Str., 3 1/8" Hole  
NO. 2 R&H, 1 1/2" Str., 5" Die Space  
NO. 16 BLISS, 1 1/2" Str., 1 7/8" Shaft  
NO. 2 HP, 1 1/2" Str., 2" Shaft  
NO. 1C R&K, 3" Shaft, 1 1/2" Str.

**NO. 7 & NO. 8 LONG & ALSTATTER  
DOUBLE END PUNCHES**  
CLEVE. SCLE. END PUNCH, 36" THR., 1" CAP.

### POWER SHEARS



10' 3/16" BERTSCH SQUARE

PRACT. NEW 14' 3/8" CAP. CINCI., 18" Cap.

156" PEXTO SQUARE, 1/4" Cap.

156" STAMCO, 3/16" Cap., 18" Gap

10' 3/16" OHL SQUARE

10' 1/4" UNITED ENG., 28" Gap

10 1/2 G NIA., 10' 3/8" Cap., 18" Gap

8' 14 GA. BERTSCH SQUARE

52" NIAGARA, 16 Ga. Cap.

NO. 236 NIA., 36", 14 Ga.

NO. 105 BLISS CIRCLE: 16 Ga. Cap.

10 NEW NO. 299 PEXTO HAND POWER RING and

CIRCLE: 20 ga. cap. and lighter.

Each . . . . . \$189.50

NO. 138-M LENNOX THROATLESS: Cap. 3/8" Mild

Steel; M.D.

### GANG SLITTERS

48" BRADDOCK (LAMB & NASH)

36" LAMB & NASH

NO. 1 AMER., 32"

28" GANG SLITTER, 3" Shaft

### FOOT SQUARING SHEARS

NEW NO. 18-52 FAMCO . . . . . \$407.50

NEW NO. 18-42 FAMCO . . . . . \$325.25

NEW NO. 18-36 FAMCO . . . . . \$244.00

NEW MODEL 137 PEXTO:

36" x 18 ga. cap.; with holddown . . . . . \$252.00

NEW NO. 1836 FRECUT . . . . . \$247.50

### POWER ROLLS

12' 3/4" ALLIANCE PYRAMID TYPE

10' PYRAMID, D.B.G., B.D.

48" BERTSCH INITIAL TYPE; D.B.G., M.D.

NEW NO. 416E PEXTO HAND POWER

SLIP ROLLS: 36" x 14 Ga. cap.

OUR SPECIAL PRICE EA . . . . . \$290.00

### BRAKES

8' 3/16" D & K PRESS BRAKE

8' 10 GA. GEORGE OHL PRESS BRAKE

CHICAGO STEEL POWER APRON BRAKES:

12' 1/4"—10' 10 Ga.

NEW NO. 6 CERWECO: 6' 14 Ga. Cap.

NEW NO. 8 CERWECO: 8' 14 Ga. Cap.

All Prices of New Items are F.O.B. Chicago and Are Subject to Escalator Clause

We Carry a Complete Stock of NEW REX WELDERS Ranging From 5 KVA Through 100 KVA

Write, Wire or Phone YARDS 5800 for Full Quotations

# INTERSTATE Machinery Co., Inc.

1433 W. PERSHING RD., CHICAGO 9, ILL.



## Index to ADVERTISERS

|                                                  |     |                                                            |     |                                       |     |
|--------------------------------------------------|-----|------------------------------------------------------------|-----|---------------------------------------|-----|
| Accurate Sheet Metal Mfg. Wks. ....              | 168 | G & S Machine Shop .....                                   | 171 | Perfection Stove Co. ....             | *   |
| Acme Electric Welder Co. ....                    | 168 | Gallahue Co. ....                                          | 167 | Perfec Corp. ....                     | 21  |
| Acme Equipment Company .....                     | *   | Galvan Mfg. Co. ....                                       | 166 | Permanente Metals Corp. ....          | 24  |
| Adams Co., The .....                             | 168 | General Blower Co. ....                                    | 58  | Petroleum Heat & Power Co. ....       | 26  |
| Aerodin Corp. ....                               | *   | General Controls .....                                     | 185 | Petroleum Equipment Co. ....          | 170 |
| Air Conditioning Exposition .....                | 159 | General Filters, Inc. ....                                 | 156 | Pioneer Tool Co. ....                 | 170 |
| Air Conditioning Products Co. ....               | 129 | Georgen-Mackwirth Co., Inc. ....                           | 31  | Potts-Farrington Co. ....             | 30  |
| Air Controls, Inc. ....                          | 22  | Gerett Corp., M. A. ....                                   | 165 | Premier Furnace Co. ....              | *   |
| Air Controls Products, Inc. ....                 | *   | Gillen Co., J. L. ....                                     | 166 | Prole & Cogan Heating Co. ....        | *   |
| Alborno Inds. ....                               | *   | Gilcor Products Corp. ....                                 | 19  | Prune & Co., Inc. ....                | *   |
| Airtemp Div. of Chrysler Corp. ....              | *   | Gosse Mfg. Co. ....                                        | 194 | Quiet Automatic Oil Burner Corp. .... | *   |
| Airtherm Mfg. Co. ....                           | *   | Grand Rapids Die & Tool Co. ....                           | 23  |                                       |     |
| A-J Mfg. Co. ....                                | 160 | Gray, G. L. ....                                           | 194 |                                       |     |
| Ajax Furnace Fitting Co. ....                    | 160 | Hall-Neal Furnace Co. ....                                 | 160 |                                       |     |
| Aldrich Co. ....                                 | 108 | Harrington & King Perforating Co. ....                     | 164 |                                       |     |
| Allen Co., Inc., L. B. ....                      | 108 | Harris, A. R. ....                                         | 164 |                                       |     |
| Allied Building Credits .....                    | 41  | Hart & Cooley Mfg. Co. ....                                | 134 |                                       |     |
| American Brass Co. ....                          | *   | Hart Oil Burner, Dept. of Avery Farm Machinery Co. ....    | 53  |                                       |     |
| American Machine Products .....                  | 45  | Harvey-Whipple, Inc. ....                                  | 170 |                                       |     |
| American Radiator & Standard Sanitary Corp. .... | 45  | Hasko Utilities Co. ....                                   | 154 |                                       |     |
| American Rolling Mill Co., The .....             | 169 | Heatecraft Co. ....                                        | 56  |                                       |     |
| American Smelting & Refining Co. ....            | 64  | Heating & Ventilating Exposition .....                     | 160 |                                       |     |
| Anemostat Corp. of America .....                 | 44  | Heatway .....                                              | *   |                                       |     |
| Armstrong Co., The .....                         | 163 | Hell Co. ....                                              | 23  |                                       |     |
| Audel & Co. ....                                 | 163 | Henry Furnace Co., The .....                               | 56  |                                       |     |
| Auer Register Co. ....                           | 52  | Hess Warming & Ventilating Co. ....                        | 140 |                                       |     |
| Automatic Burner Corp. ....                      | 82  | Hexdall Co., A. M. ....                                    | 167 |                                       |     |
| Automatic Furnace Co. ....                       | *   | Holly Mfg. Co. ....                                        | *   |                                       |     |
| Automatic Humidifier Co. ....                    | 169 | Hotstream Heater Co. ....                                  | 14  |                                       |     |
| Automatic Products Co. ....                      | 44  | Howell Oil Burner Co., H. A. ....                          | 66  |                                       |     |
| Bacharach Industrial Instrument Co. ....         | 158 | Hussey & Co., C. G. ....                                   | *   |                                       |     |
| Barber Colman Co. ....                           | 159 |                                                            |     |                                       |     |
| Barber Gas Burner Co., The .....                 | 156 | Illinois Bronze Powder Co. ....                            | 161 |                                       |     |
| Barnes, Inc., H. C. ....                         | 141 | Independent Register Co. ....                              | 171 |                                       |     |
| Barth Mfg. Co. ....                              | 167 | Interstate Machinery Co. ....                              | 25  |                                       |     |
| Bayley Blower Co. ....                           | 168 | Jackson & Church Co. ....                                  | 51  |                                       |     |
| Beall Pipe & Tank Corp. ....                     | 29  | Jackson Company, S. T. ....                                | 170 |                                       |     |
| Berger Bros. Co. ....                            | 158 | Jones & Brown, Inc. ....                                   | *   |                                       |     |
| Berger Mfg. Div. Republic Steel Corp. ....       | 159 | Juniper Elbow Co., Inc. ....                               | *   |                                       |     |
| Bethlehem Steel Co. ....                         | 151 | Kehm Corp., The .....                                      | 148 |                                       |     |
| Beverly Shear Co. ....                           | 167 | Kirk & Blum Mfg. Co. ....                                  | *   |                                       |     |
| Bishop & Balcock .....                           | 62  | Kling Bros. Engr. Works .....                              | 149 |                                       |     |
| Black & Decker Mfg. Co. ....                     | 171 | Knight Co., The James .....                                | 171 |                                       |     |
| Bone Tool & Gauge Company .....                  | 142 | Krauser-Boyd, Inc. ....                                    | *   |                                       |     |
| Brauer Supply Mfg. Co., A. G. ....               | 42  | Kresky Mfg. Co. ....                                       | 162 |                                       |     |
| Breeze Burners, Inc. ....                        | 54  | Kresno Stamm Mfg. Co. ....                                 | 43  |                                       |     |
| Brenner Co., Jacob .....                         | 15  | Krueger Sentry Gauge Co. ....                              | 165 |                                       |     |
| Brooks Co., Inc., B. D. ....                     | 18  |                                                            | 165 |                                       |     |
| Brundage Co. ....                                | 167 | Lakewood Engr. Co. ....                                    | 55  |                                       |     |
| Bryant Heater Co. ....                           | 167 | Lau Blower Co. ....                                        | 150 |                                       |     |
| Burden Co. ....                                  | *   | Libert Machine Co. ....                                    | 157 |                                       |     |
| Carnegie-Illinois Steel Corp. ....               | 16  | Lincoln Electric Co. ....                                  | 136 |                                       |     |
| Century Electric Co., Refining Co. ....          | 15  | Lockformer Co. ....                                        | 5   |                                       |     |
| Century Engrg. Corp. ....                        | 18  | Made-Rite Furnace Pipe & Fitting Co. ....                  | 54  |                                       |     |
| Certified Furnace Co. ....                       | 167 | Maid-O'-Mist, Inc. ....                                    | 32  |                                       |     |
| Char-Gale Mfg. Co. ....                          | *   | Majestic Co. ....                                          | 161 |                                       |     |
| Cheney Inds. ....                                | *   | Maplewood Machinery Co. ....                               | *   |                                       |     |
| Cherry Rivet Co. ....                            | *   | Marshalltown Mfg. Co. ....                                 | 169 |                                       |     |
| Chevrolet Motor Div., General Motors Corp. ....  | *   | Maurey Mfg. Co. ....                                       | 60  |                                       |     |
| Clarage Fan Co. ....                             | *   | May-Fieberger Co. ....                                     | 165 |                                       |     |
| Clayton & Lambert Mfg. Co. ....                  | *   | McDonnell & Miller, Inc. ....                              | 165 |                                       |     |
|                                                  |     | Mercol Corp., The .....                                    | 8   |                                       |     |
| Clean Sweep Co., The .....                       | 167 | Meyer & Bro. Co., F. ....                                  | 7   |                                       |     |
| Cleveland Humidifier Co. ....                    | 162 | Meyer Furnace Co. ....                                     | 158 |                                       |     |
| Cole-Sewell Engineering Co. ....                 | *   | Midco Register Corp. ....                                  | 145 |                                       |     |
| Coleman Co., Inc., The .....                     | 170 | Midco Mfg. Co. ....                                        | 94  |                                       |     |
| Colson Equip. & Supply Co. ....                  | 16  | Milcor Steel Co. ....                                      | 165 |                                       |     |
| Columbia Burner Co., The .....                   | 54  | Miller & Doing .....                                       | 155 |                                       |     |
| Columbia Steel Co. ....                          | 16  | Milton Equipment Co. ....                                  | 40  |                                       |     |
| Combustioneer-The Steel Products Engrg. Co. .... | 153 | Mnneapolis-Honeywell Regulator Co. ....                    | 57  |                                       |     |
| Conco Engineering Works .....                    | 131 | Morey, Dan .....                                           | 104 |                                       |     |
| Condensation Engineering Corp. ....              | 159 | Morrison Products, Inc. ....                               | 13  |                                       |     |
| Conner Engrg. Co., W. B. ....                    | 166 | Morrison Steel Products, Inc. ....                         | 139 |                                       |     |
| Cotta Transmission Corp. ....                    | 50  | Mt. Vernon Furnace & Mfg. Co. ....                         | 161 |                                       |     |
| Crescent Parts & Equip. Co. ....                 | 166 | Mueller Furnace Co., L. J. ....                            | 167 |                                       |     |
| Crescent Tool Co. ....                           | 50  | Mulkey Co., J. F. ....                                     | 13  |                                       |     |
|                                                  |     |                                                            | 139 |                                       |     |
| Dahlstrom Machine Works .....                    | 166 | National Metal Fabricators .....                           | 161 |                                       |     |
| Dana Fan & Blower Co. ....                       | 155 | National Super Service Co. ....                            | 167 |                                       |     |
| Davis & Son Machine Works .....                  | *   | Nelson Corp., Herman .....                                 | *   |                                       |     |
| Des Moines Stove Repair Co. ....                 | 156 | Niagara Furnace Div. of the Forest City Foundries Co. .... | 36  |                                       |     |
| Detroit Air Filter Co. ....                      | 160 | Niagara Machine & Tool Works .....                         | 145 |                                       |     |
| Detroit Lubricator Co. ....                      | 48  | Norge-Heat Div., Borg-Warner Corp. ....                    | *   |                                       |     |
| Detroit Stamping Co. ....                        | 163 | Northwestern Stove Repair Co. ....                         | 138 |                                       |     |
| Doyle Vacuum Cleaner Co. ....                    | 159 | Nu-Way Corp. ....                                          | 161 |                                       |     |
| Dravo Corp. ....                                 | 171 |                                                            | 167 |                                       |     |
| Drels & Krump Mfg. Co. ....                      | 166 | Ohio Electric Mfg. Co. ....                                | 17  |                                       |     |
| Dresser Industries (See Bryant Heater Co.) ..... | *   | Olsen Mfg. Co., C. A. ....                                 | 14  |                                       |     |
| Elgo Shutter & Mfg. Co. ....                     | 166 | Omaha Stove Repair Works .....                             | 165 |                                       |     |
| Enderle, Inc., Ltd., Frank X. ....               | 166 | Owens-Corning Fiberglass Corp. ....                        | 14  |                                       |     |
|                                                  |     |                                                            | 14  |                                       |     |
| Fanco Machine Co. ....                           | *   | Packard Elec. Div., General Motors Corp. ....              | 37  |                                       |     |
| Field Control Div., H. D. Conkey & Co. ....      | 151 | Palmer Mfg. Co. ....                                       | *   |                                       |     |
| Fireline Stove & Furnace Lining Co. ....         | 59  | Parker Mfg. Co. ....                                       | 108 |                                       |     |
| Firewel Company, Inc. ....                       | 152 | Parker-Kalon Corp. ....                                    | 146 |                                       |     |
| Fittgibbons Boiler Co., Inc. ....                | 33  | Patten Co., J. V. ....                                     | 143 |                                       |     |
| Foillanabee Steel Corp. ....                     | 171 | Peck, Stow & Wilcox Co. ....                               | 27  |                                       |     |
| Ford Motor Co. ....                              | 141 | Peerless Foundry Co. ....                                  | *   |                                       |     |
| Fraser .....                                     | *   | Penn Bolier & Burner Mfg. Co. ....                         | 163 |                                       |     |
| Frayn Co. ....                                   | 163 | Penn Electric Switch Co. ....                              | 157 |                                       |     |
| Fried Air-Kool Co. ....                          | *   | Penn Tool Co. ....                                         | 163 |                                       |     |
| Front Rank Furnace Co. ....                      | *   |                                                            | 157 |                                       |     |
|                                                  |     |                                                            | 157 |                                       |     |
|                                                  |     |                                                            | 157 |                                       |     |
|                                                  |     |                                                            | 157 |                                       |     |
|                                                  |     |                                                            | 157 |                                       |     |
|                                                  |     |                                                            | 157 |                                       |     |
|                                                  |     |                                                            | 157 |                                       |     |
|                                                  |     |                                                            | 157 |                                       |     |
|                                                  |     |                                                            | 157 |                                       |     |
|                                                  |     |                                                            | 157 |                                       |     |
|                                                  |     |                                                            | 157 |                                       |     |
|                                                  |     |                                                            | 157 |                                       |     |
|                                                  |     |                                                            | 157 |                                       |     |
|                                                  |     |                                                            | 157 |                                       |     |
|                                                  |     |                                                            | 157 |                                       |     |
|                                                  |     |                                                            | 157 |                                       |     |
|                                                  |     |                                                            | 157 |                                       |     |
|                                                  |     |                                                            | 157 |                                       |     |
|                                                  |     |                                                            | 157 |                                       |     |
|                                                  |     |                                                            | 157 |                                       |     |
|                                                  |     |                                                            | 157 |                                       |     |
|                                                  |     |                                                            | 157 |                                       |     |
|                                                  |     |                                                            | 157 |                                       |     |
|                                                  |     |                                                            | 157 |                                       |     |
|                                                  |     |                                                            | 157 |                                       |     |
|                                                  |     |                                                            | 157 |                                       |     |
|                                                  |     |                                                            | 157 |                                       |     |
|                                                  |     |                                                            | 157 |                                       |     |
|                                                  |     |                                                            | 157 |                                       |     |
|                                                  |     |                                                            | 157 |                                       |     |
|                                                  |     |                                                            | 157 |                                       |     |
|                                                  |     |                                                            | 157 |                                       |     |
|                                                  |     |                                                            | 157 |                                       |     |
|                                                  |     |                                                            | 157 |                                       |     |
|                                                  |     |                                                            | 157 |                                       |     |
|                                                  |     |                                                            | 157 |                                       |     |
|                                                  |     |                                                            | 157 |                                       |     |
|                                                  |     |                                                            | 157 |                                       |     |
|                                                  |     |                                                            | 157 |                                       |     |
|                                                  |     |                                                            | 157 |                                       |     |
|                                                  |     |                                                            | 157 |                                       |     |
|                                                  |     |                                                            | 157 |                                       |     |
|                                                  |     |                                                            | 157 |                                       |     |
|                                                  |     |                                                            | 157 |                                       |     |
|                                                  |     |                                                            | 157 |                                       |     |
|                                                  |     |                                                            | 157 |                                       |     |
|                                                  |     |                                                            | 157 |                                       |     |
|                                                  |     |                                                            | 157 |                                       |     |
|                                                  |     |                                                            | 157 |                                       |     |
|                                                  |     |                                                            | 157 |                                       |     |
|                                                  |     |                                                            | 157 |                                       |     |
|                                                  |     |                                                            | 157 |                                       |     |
|                                                  |     |                                                            | 157 |                                       |     |
|                                                  |     |                                                            | 157 |                                       |     |
|                                                  |     |                                                            | 157 |                                       |     |
|                                                  |     |                                                            | 157 |                                       |     |
|                                                  |     |                                                            | 157 |                                       |     |
|                                                  |     |                                                            | 157 |                                       |     |
|                                                  |     |                                                            | 157 |                                       |     |
|                                                  |     |                                                            | 157 |                                       |     |
|                                                  |     |                                                            | 157 |                                       |     |
|                                                  |     |                                                            | 157 |                                       |     |
|                                                  |     |                                                            | 157 |                                       |     |
|                                                  |     |                                                            | 157 |                                       |     |
|                                                  |     |                                                            | 157 |                                       |     |
|                                                  |     |                                                            | 157 |                                       |     |
|                                                  |     |                                                            | 157 |                                       |     |
|                                                  |     |                                                            | 157 |                                       |     |
|                                                  |     |                                                            | 157 |                                       |     |
|                                                  |     |                                                            | 157 |                                       |     |
|                                                  |     |                                                            | 157 |                                       |     |
|                                                  |     |                                                            | 157 |                                       |     |
|                                                  |     |                                                            | 157 |                                       |     |
|                                                  |     |                                                            | 157 |                                       |     |
|                                                  |     |                                                            | 157 |                                       |     |
|                                                  |     |                                                            | 157 |                                       |     |
|                                                  |     |                                                            | 157 |                                       |     |
|                                                  |     |                                                            | 157 |                                       |     |
|                                                  |     |                                                            | 157 |                                       |     |
|                                                  |     |                                                            | 157 |                                       |     |
|                                                  |     |                                                            | 157 |                                       |     |
|                                                  |     |                                                            | 157 |                                       |     |
|                                                  |     |                                                            | 157 |                                       |     |
|                                                  |     |                                                            | 157 |                                       |     |
|                                                  |     |                                                            | 157 |                                       |     |
|                                                  |     |                                                            | 157 |                                       |     |
|                                                  |     |                                                            | 157 |                                       |     |
|                                                  |     |                                                            | 157 |                                       |     |
|                                                  |     |                                                            | 157 |                                       |     |
|                                                  |     |                                                            |     |                                       |     |

**Firms represented in this issue are identified by the folio of the page on which their advertising appears. Advertising which appears in other issues is marked with an asterisk.**

# Work Sheet For Sheet Metal Workers

## In Stock Reynolds Utility Aluminum



All of the sheets you want ~~for work~~  
in the sheet sizes you want to ~~work~~  
with the machinery you now have ~~at work~~



Here, too, Aluminum cor-  
rugated sheets in stock.

In a phrase, Reynolds Utility Aluminum meets galvanized  
steel on a competitive level—including price. You can  
have all you want—now. For full information, without  
obligation, phone Republic 9100, or write,

## **BENJAMIN WOLFF <sup>AND</sup> COMPANY**

General Office and Warehouse — 5800 South Seeley Ave., Chicago 36, Ill.

Wisconsin Office — 176 W. Wisconsin Ave., Milwaukee 3, Wis.

*Sell Grease Filters  
to the Restaurant Field*

**REDUCE FIRE HAZARD**



**RESEARCH**

"Clean Duct"

*Grease* **FILTERS**

Made of washable  
**ALUMALOY** — meets  
recommendations of Na-  
tional Fire Protection  
Assn.

*Free*

Descriptive literature  
and technical data  
sheets supplied prompt-  
ly upon request.



Sheet metal workers all over the nation find restaurants, hotels, clubs and other commercial eating establishments ready prospects for Research Grease Filter installations . . . and this perfect "foot in the door" opens the way for a great many profitable modernizing programs. Research Grease Filters are 98% effective in catching highly inflammable kitchen vapors. Made of high lustre aluminum, they harmonize in beauty and appearance with modern range canopies.

**RESEARCH PRODUCTS CORPORATION**  
MADISON 3, WISCONSIN



able  
meets  
of Na  
ection